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ABSTRACT

Presented in both French and English, the document contains extracts from a review of the literature on students with learning disabilities (LD) and on French speaking exceptional students' programs and needs. The review of LD includes sections on approaches to definition and classification, incidence, and definitional components (intelligence, process, academic, discrepancy, neurological, and exclusion). The conclusion notes differences between the neurological and educational approaches and problems with operationalizing definitions. The second part of the document reviews the literature on behavioral exceptionalities (emotional disturbance and social maladjustment); communication exceptionalities (hearing, learning disabilities, and speech/language disorders); intellectual exceptionalities (gifted/talented, mentally handicapped); physical exceptionalities (limited vision and orthopedic/other physical handicaps). The conclusion notes certain themes applicable to all types of exceptionality: (1) the importance of early identification; (2) the issue of mainstreaming; (3) the importance of regular teacher education including components on exceptional children; (4) the need for service delivery models to provide a wide range of services; and (5) the need for multidisciplinary responsibility for assessment, planning, and instruction. (DB)

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EXCEPTIONAL PUPILS: A REVIEW OF THE LITERATURE

Extracts from

Education for Students with Learning Disabilities:
Guidelines for Development of Programs and Services

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and from

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Programs and Needs

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CHAPTER I

DEFINITION AND CLASSIFICATION OF LEARNING DISABILITIES

Learning disabilities (LD) probably represents the most controversial issue in special education today. While LD has earned recognition as a distinct category of exceptionality and despite advancements in recent years, specialists continue to assume polarized positions as to what exactly constitutes a learning disability.

Because research has not yet succeeded to conclusively establish its etiology, and because LD is manifested in numerous different forms, an absolute and acceptable definition remains to be developed.

Lacking a concise definition which can be translated into operational terms and which can serve as a basis for diagnosis, it is inevitably difficult to determine how many children require specialized instruction. Accordingly, there are few resources available to educators who seek to develop a comprehensive program to meet the needs of the LD Child. Until LD is more fully understood, the efficacy of current diagnostic and remedial approaches remains theoretical.

Thus at every level of educational programming - from the point of identification through to program placement - LD presents a formidable problem to administrators of special education.

This review of the literature will thus attempt to examine the problems facing the field, within a framework in which approaches to definition and related diagnostic strategies will be discussed.

In the first section, approaches to definition and classification are presented. In section two, the problems associated with the determination of incidence are briefly discussed. The final chapter deals with the six definitional components most commonly found in current definitions-intelligence, process, academic, discrepancy, neurological and exclusion - in order to illustrate how these are made operational for purposes of diagnosis.

I. APPROACHES TO DEFINITION AND CLASSIFICATION

Research in the field of learning disabilities began as educators became increasingly aware of certain children who experience school failure, yet elude traditional categories of exceptionality. Since the time of Strauss and Lehtinen (1947), such a child has been variously termed "brain injury", minimal brain dysfunction", maturational lag", perceptual disability", dyslexia", expressive-receptive language disorder", learning disability", etc. . . . (See Clements, 1966). Such an abundance of terms exemplifies the lack of agreement which dominates the field of LD research. The literature abound with controversy concerning the definition, diagnosis, etiology, and remediation of LD. Throughout, the recurring theme is that there is a need to establish an LD definition which satisfies all disciplines; one which identifies a homogeneous group of children for the purpose of developing diagnostic sub-categories and tailoring specific programs of remediation (Ackerman, Peters and Dykeman, 1971).

Presently, there are several LD definitions which have gained some acceptance by practitioners in the field, and which reflect the differing approaches to the classification of LD.

One which has received much attention is that provided by the National Advisory Committee on Handicapped Children (NACHC, 1968), which stresses neuropsychological disorders:

Children with specific learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using written or spoken language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. . . . They do not include conditions which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance, or to environmental deprivations.

The NACHC definition, although probably the most influential (see Mercer, Forgnone and Wolking, 1976) is also one which has been extensively criticised (Coleman and Davis, 1976; Hammill, 1976; Wiederholt, 1974). Hammill suggests that it is "much too obscure, open-ended, and subjective to be used as actual criteria for selecting students".

In general, the problem with present LD definitions is their lack of specificity. As the Ontario Ministry of Education (1971) has indicated:

The usual definition is very broad and inclusive. School divisions *must* functionally define their own language and/or learning disability population by providing information in the functional definition about children who will be excluded; as well as included. Such definition should also have reference to some rather specific cut-off points for exclusion.

Central to this issue is the question of etiology, for in attempting to formulate a definition which identifies a group of children with similar educational needs, etiological factors serve to distinguish the learning disabled child from those whose learning problems stem primarily from other handicapping conditions.

A review of the literature suggests that there are three major approaches to the dilemma of etiology, from which three broad categories of definitions may be identified. In examining the issues responsible for this basic divergence in theoretical orientation, the major questions obscuring the classification and definition of learning disabilities are recognized.

One approach, variously referred to as the traditional, diagnostic, etiological, or medical approach, emphasizes the role of central nervous system (CNS) function in the development of learning disabilities. The NACHC definition includes the neurological component in the statement "They include conditions which have been referred to as . . . brain injury, minimal brain dysfunction, dyslexia" (Mercer, Forgnone, Wolking, 1976). Johnson and Myklebust (1967) use the term "psychoneurological learning disability", to describe learning behaviour which "has been disturbed as a result of a dysfunction of the brain and that the problem is one of altered processes, not of a generalized incapacity to learn".

Clements (1966), in his definition of "minimal brain dysfunction" (MBD) allows for a continuum of neurological disorders:

... refers to children of near average, average, or above average intelligence, with certain learning or behavioural disabilities ranging from mild to severe, which are associated with deviations of function of the central nervous system. These deviations may manifest themselves by various combinations of impairment in perception, conceptualization, memory, and control of attention, impulse, or motor function. Similar symptoms may or may not complicate the problems of children with cerebral palsy, epilepsy, mental retardation, blindness or deafness. These deviations may arise from genetic aberrations, biochemical irregularities, perinatal insults, or other illnesses or injuries sustained in the years critical for the maturation and development of the central nervous system. The definition also allows for the possibility that early deprivation could result in central nervous system alterations which may be permanent.

Similarly, Cruickshank (1977) stresses the role of neurophysiological function on LD, although his definition is one which recognizes environment as an important influence in neurological development:

... (1) learning disabilities are problems in the acquisition of developmental skills, academic achievement, social adjustment, which are the result of perceptual and linguistic processing deficits. Further defined, learning disabilities (2) may be of any etiological origin, (3) may be observed in children and youth of any age (4) of any intellectual function, (5) are the result of perceptual processing deficits which, in turn (6) are or may be the result of a (diagnosed or inferred) neurophysiological dysfunction occurring at the prenatal, perinatal, or (in the case of linguistic dysfunction) at the postnatal periods of development.

Cruickshank contends that perception is a neurological process, and that perceptual disorders are thus reflections of neurological dysfunction, however caused. This opinion is also expressed in Wepman et al's (1975) definition of specific learning disability, in which perceptual and neurological processes are equated:

Specific learning disability refers to those children of any age who demonstrate a substantial deficiency in a particular aspect of academic achievement because of perceptual or perceptual-motor handicaps, regardless of etiology, or other handicapping conditions. The term perceptual is related to those mental (neurological) processes through which the child acquires his basic alphabets of sounds and forms.

Other investigators have taken a less rigid position with respect to CNS involvement, allowing the role of neurological factors underlying LD greater flexibility. The Council for Exceptional Children (CEC; Barsch, 1967), for example, suggests that the total LD population, includes, in addition to CNS related disabilities, children whose learning problems are not neurologically caused:

A child with learning disabilities is one with adequate mental ability, sensory processes, and emotional stability who has specific deficits in perceptual, integrative, or expressive processes, which severely impair learning efficiency. This includes children who have central nervous system dysfunction which is expressed primarily in impaired learning efficiency.

In a follow-up to Clement's (1966) MBD study, Haring and Bateman (1969) propose two LD definitions, which are even less committal in their reference to neurological etiology. One definition cites intra-individual differences in performance as the determining factor in LD, the other cites discrepancy between achievement and potential. In both, it is stated that children who manifest such discrepancies "may or may not show demonstrable deviations in central nervous system functioning". It is not entirely clear whether this statement is an indication that the authors recognize some learning disabilities to have a neurological basis, while others do not, or whether it is meant to imply that even in the absence of neurological confirmation, CNS influence must be assumed.

Regardless of the interpretation assigned to such definitions, and the fact that the importance of the CNS as a causative factor varies from author to author, all commonly accept the relationship between perceptual and neurological processes to be of such significance as to warrant mention in the definition of LD.

Among those who adhere to this general model, there are many who employ an exclusion component to delineate the LD population on the basis of etiology. The NACHC (1968) definition, for example, excludes visual, hearing or motor handicaps, mental retardation, emotional disturbance, and environmental deprivation as causes of LD. The CEC (Barsch, 1967) stipulates that the LD child must have "adequate mental ability, sensory processes, and emotional stability. For Haring and Bateman (1969), "general mental retardation, cultural, sensory, and/or educational deprivation, or environmentally produced serious emotional disturbance" must be excluded as causative factors.

Similarly, McIntosh and Dunn (1973), in describing children with major specific learning disabilities (MSLDs) as those "who display ... a discrepancy between capacity and performance in a ... learning process involving perception, conception, or expression, associated

with the areas of oral and written language, or mathematics", specify that such discrepancy is unrelated to "mental retardation, nor any of the traditional handicapping conditions". (Kirk's (1972) definition of LD as developmental discrepancies in ability, generally excludes "other handicapping conditions".

Such a variance of opinion is a major point of concern among LD specialists; for whether a definition directly implicates CNS involvement, eliminates certain other causes through an exclusion clause, or makes no reference to etiology whatsoever, is of major significance in its educational implementation. The fact that Cruickshank's (1977) definition points to an inclusion of mental retardation, for example, represents a major area of disagreement between he and Underwood (1977). Expressing the opinion of the Ontario Association for Children with Learning Disabilities *OACLD*, Underwood states that, "It cannot possibly be argued that learning disabilities do not occur in mentally retarded individuals, but . . . We must narrow that definition to include, at least, only those children with normal intellectual potential . . .". Similarly, a decision to adopt a definition which includes emotional disturbance as a basic cause of LD (i.e. Kass and Myklebust, 1969; NACHC, 1968) can dramatically change the final diagnostic decisions in a particular school system.

The controversy surrounding etiology, however, remains focused primarily on neurological questions. One problem, as Grotberg (1970) points out, is that environmental stresses may produce the same results as internal conditions, as far as neurological development is concerned. "A non-developing nervous system may indeed produce the same learning disability symptoms as a damaged one". Related to this, many studies have established that a higher incidence of neurological impairment can be expected in lower socio-economic classes (Passamarick and Knoblock, 1961; Birch and Gussow, 1970). For this reason, many definitions (i.e. NACHC, 1968) are accused of ignoring the needs of the disadvantaged by specifically excluding learning problems which result from cultural deprivation (Herrick, 1973).

Compounding the problem is the fact that it is often impossible to verify CNS damage in individuals who exhibit typical LD symptoms; conversely, learning problems may be absent in the presence of verified CNS dysfunction (Stevens and Birch, 1957).

Thus, the literature indicates that many LD specialists have chosen an alternative to the traditional approach – the educational, behavioural, or remedial approach. Advocates of this model dispute the value of neurological, or any etiological, factors for differential diagnosis, and maintain that LD should be defined behaviourally, rather than on causes and symptoms. Underlying this educational approach is the belief that definition and diagnosis on the basis of etiology serves no purpose; that the cause of LD is irrelevant to the design and analysis of instructional programs.

Valett (1969), in supporting this belief, avoids the question of etiology entirely, defining LD as "... any specific difficulty in acquiring and using information or skills that are essential to problem solution". Farrald and Schramber (1973) are more explicit in their educational emphasis, contending that the learning disabled child is "... any child who – for whatever reason – consistently fails to meet the demands of the curriculum to which he is assigned and whose unique learning characteristics necessitate extensive remodelling and reconstruction of teaching interventions for efficient learning".

Similarly, Kass and Myklebust (1969) describe LD as,

... one or more significant deficits in essential learning processes requiring special education techniques for their remediation. Children with a learning disability generally demonstrate a discrepancy between expected and actual performance in one or more areas, such as spoken, read, or written language, mathematics, and spatial orientation.

Further to these two major approaches, which express polarized opinions with regards to etiology, a third position is taken by those who have chosen to extract certain views from either extreme. This third approach to LD definition and etiology is based on the premise that while CNS factors are of little value to an understanding of LD, disordered learning must be analysed in term of causative factors at the level of perceptual processing.

Briefly stated, those who advocate defining LD in terms of process deficits commonly recognize a correlation between the presenting academic difficulty and underlying perceptual, integrative, or expressive dysfunctions (Bateman, 1967). Thus, although the approach is etiological in terms of its recognition of perceptual process dysfunction as the cause of learning problems, it does not extend into the realm of neurological explanations. Moreover, although much emphasis is placed on the remediation of perceptual disorders, an understanding of observable behavior alone is viewed to be insufficient for purposes of educational definition and diagnosis.

The majority of definitions currently in use, according to Vaughan and Hodges (1973) and Li (1977) make reference to process deficits. With its inherent emphasis on a correlation between LD and perceptual deficit, the process approach is both the mainstay of current practice and at the same time, the most controversial issue in the field today.

Both the hypothesis of LD as a correlated disability, and the tests used to identify such disorders have been subject to widespread criticism. This controversy will be more fully discussed in a subsequent section.

Thus, a review of the literature suggests that there are two major approaches to LD, representing polarized views of etiology, and a third approach which has sought to compromise these extremes via reference to underlying process deficits. None of these approaches, however, have succeeded to develop a definition of LD which may be universally accepted.

It appears, therefore, that there is no one known classification method for LD. The major problem impeding any universal understanding is that, given the present state of neurological research, learning problems cannot be neatly separated on the basis of etiology. Some advocate that etiological factors are important parameters in the definition and diagnosis of LD. Others argue that classification should be based on the learning characteristics of all children experiencing academic difficulty, regardless of cause, and suggest defining LD with reference to those skills relevant for performance in the educational setting.

In doing so, it is believed that children in a particular LD group would have similar test and behaviour profiles, not simply similar labels, and thereby be more homogeneously grouped (Anderson, 1976).

Frierson and Barbe (1967) describe these two approaches as being cause-oriented and effect-oriented. They explain that while the first is concerned with etiology, the second is concerned with analyzing, describing, and modifying observed behaviours, and often identifies other children with special needs who are not considered as learning disabled (Faas, 1976).

In general, due to the multiplicity of factors affecting the way in which a child learns, "it is difficult for us to use present diagnostic information to adequately group children for educational purposes" (McDonald, 1968). As McDonald points out "unless one is able to pin down the parameters being used . . . it is virtually impossible to know the exact population of children in which he is interested".

According to Wiederholt (1974), the present formalization of the LD field is preceded by two phases of development: the formation phase, during which the nature and causes of specific learning disorders represented the major area of emphasis, followed by the transition phase, characterized by efforts to translate this knowledge into remedial educational practices. The current period, the integration phase, consists of the merging of the theoretical and clinical contributions of authors concerned with three types of disorders - disorders of written language, of spoken language, and of perceptual and motor processes - into a comprehensive diagnostic-remedial approach. He points out, however, that a lack of communication among specialists concentrating upon any of these three different types of LD, and between the two major approaches, has prevented any significant advancement in recent years.

Wiederholt's contention is given much support in the literature, where any consistency in the various interpretations of areas of deficit classified under the general term, learning disability, is nonexistent. Kephart (1971), viewing all learning disabilities to be a function of perceptual-motor difficulty, differentiates among problems as they are related to the

developmental level of certain subareas of perceptualmotor behaviour. According to Valett (1969), a specific LD refers to any one of six discriminable areas: gross motor development, sensory motor integration, perceptual motor skills, social skills, language development, and conceptual skills. Myers and Hammill (1976) also outline six areas of disability: emotionality, motor activity, perception, symbolization, attention, and memory.

All such interpretations represent differing delineations of the three basic LD types indicated by Wieberholt (1974). Moreover, they are intended more as a guide for outlining behavioural characteristics than as a basis for classification. Nevertheless, unless one is fully familiar with the terminology and the complex theoretical framework from which such formulations develop, they are open to misinterpretations, and contribute little to an understanding of LD classification.

The pitfalls to be avoided in developing an acceptable definition are well known to specialists in the field of LD research. Gearheart (1977) lists the definitional errors appearing most frequently in current definitions, summarized as follows:

1. Failure to indicate degree of disability; may potentially be used to include a very high percentage of children in any given school. On this point, it should be noted there have been recent attempts to overcome this problem. Kidd (1971, in Farrald and Schramber, 1973) postulates a three-dimensional model of LD, in which each of three dimensions are seen as crucial parameters in any attempt at categorization: one dimension relates to specificity – highly specific to quite general; and a third dimension relates to remediability – readily remediable to unremediable. ADAPT (Farrald and Schramber, 1973) proposes a five-point classification system, in which each of five levels of increasing LD severity are matched with appropriate strategies for developing diagnostic and remedial programs.
2. The exclusion of culturally disadvantaged is subject to abuse. Depending on how a school chooses to misinterpret this clause, may be used to deny special services to culturally disadvantaged students who are, in fact, learning disabled, or, as justification for misplacing culturally disadvantaged, non-learning disabled students in LD programs.
3. Because actual CNS dysfunction is a determination outside the realm of the educator, its inclusion as an etiological factor in the definition may do more to deter good programming than to help it.
4. Makes no attempt to differentiate between temporary, symptomatic problems, and more specific, long-term problems.

Further to these cautions, Haring and Bateman (1969) outline additional practical considerations for those concerned to improve upon definitions currently in use.

Basic guidelines in the development of educational definitions of children with learning disabilities should establish definitions which encourage 1) facilitation of services for children, 2) breadth for inclusion of all children needing these services, 3) exclusiveness for avoidance of inefficient overlap with other services, 4) flexibility.

Even given this knowledge of the objectives to be met in defining LD, the means presently available to do so do not predispose any major breakthrough. As ADAPT (Farrald and Schramber, 1973) has indicated, there is a tendency to question the validity of current classification systems, since they suggest a precision of definition and measurement which has not yet been produced.

At this point in the history of LD research, the level of understanding to which the field has aspired is represented in the points of basic agreement found in current definitions. From the various authors who have identified commonly recognized elements (Gearheart, 1977; Kirk, 1972; Lerner, 1976; Myers and Hammill, 1976), the following points have been derived:

1. Recognition of the general role of CNS dysfunction.

2. The principle of disparity – the academic difficulty/process disorder is characterized by intra-individual discrepancies among abilities, as well as discrepancies between potential and achievement.
3. Exclusion clause – the learning problem is considered to be specific, and not a correlate of other handicapping conditions (i.e. mental retardation, emotional disturbance, etc. . . .)
4. Relevance of the problem to the learning process – the deficit, disorder, dysfunction must be evidenced in a process involved in learning such as language, memory, reading, spelling, arithmetic, conception, perception . . . or other related abilities.
5. The primary focus of identification should be psycho-educational.

II. INCIDENCE

Estimates of the incidence of LD vary according to the criteria indicated, and the degree of inclusion and exclusion employed in the definition; the more liberal the definition, the higher the percentage reported. After reviewing twenty-one studies conducted for the purpose of determining an accurate incidence figure, Bryant and McLoughlin (1972) concluded that estimates ranged from three to twenty-eight percent, one-half of which were above thirteen percent. Hissink (1972); in Myers and Hammill, (1976), surveyed 100 leaders in the field concerning their estimates of incidence, and found that half of the respondents estimated a figure of five percent or less, and that one-third thought it to be fifteen percent or higher.

Such contradictory reports of incidence appear to be related to the absence of any definitive operational criteria. The NACHC definition (1968), which focuses on students with perceptual learning problems, and excludes those with less serious learning problems, recommends an estimate of one to three percent (Perkins, 1976). The Canadian Association for Children with Learning Disabilities (CACL), places the figure at approximately 10% of the total population, which is, according to Underwood (1976), "if anything . . . a bit conservative". Furthermore, while it is not unusual to find estimates as high as thirty percent reported in the literature, many investigators suggest that an even more conservative estimation of one percent is the most acceptable (i.e., Brenton and Gilmore, 1976; McIntosh and Dunn, 1973; Ontario Ministry of Education, 1971). Thus, as Senf and Sushinsky (1975) point out "It is unquestionably possible to define learning disabilities operationally to produce whatever incidence figure one wishes, and to limit services by virtue of that definition".

The extent to which specialists differ in their opinions as to what constitutes a learning disability and how many children it affects, is illustrated in Hammill's (1976) conception of the stage to which the field has developed. He contends that, at present, there are three basic approaches to interpreting, i.e., operationalizing the definition of LD: first, the "strict constructionist" interpretation conceives LD as including little more than the "hard core", i.e., classically defined clinical types, especially the dyslexic, dysphasic, and/or the Strauss-syndrome student; the second approach employs a considerably more liberal, loose interpretation which permits the inclusion of the under-achiever, unmotivated, and poorly taught student, i.e. the "soft core" varieties; in the third interpretation, the standard for identification are less rigorous than the first, though more rigid than the second.

Inevitably, there will be a wide margin between the incidence figures quoted by those who follow the first and those who follow the second approach. Both extremes are well represented in the literature, and are equally resistant to any compromise of their position.

Clearly, the literature sheds little light on the issue of incidence. Nonetheless, on the basis of available research, it is possible to cautiously narrow the range within which one may place the incidence of LD.

Myklebust and Boshes (1969) for example, based on an educational discrepancy definition which employs a learning quotient (LQ) as the criterion, consider 7.5 per cent of school children to be learning disabled. Mercer Forgnone and Walking (1976) reported that one operational definition field tested in Florida identified 5% of the K-2 student population.

It is within this approximate range of 5-7.5% that studies employing specific operational criteria as a screening device frequently place the incidence of LD. It should be noted, however, that in attempting to establish the efficacy of their instrument, such studies undoubtedly seek to identify all children who exhibit symptoms of LD, including those who require only minimal special attention within the regular classroom.

Thus, although an accurate estimate of incidence is impossible until research provides more objective criteria for identification, there is some evidence to suggest that some 5-7.5% of children exhibit symptoms of LD, whereas those moderate to severe cases requiring special education provisions are within the range of 1 to 3%.

Despite the ambiguity surrounding the question of incidence, it has been conclusively established that there is a male preponderance within the LD group. Yahraes and Prestwich (1976) point out that the ratio of boys and girls range - depending on the study from 1.3 to 1 at the lower end, to 15 to 1 at the upper.

Most studies, however (i.e. Kirk and Elkins, 1975; Gruenberg, 1964; Paine et al, 1968) concur that LD affects approximately three times as many boys than girls. Various explanations for this difference have been proposed; Passamarick (1959) contends that males are more susceptible than females to CNS alterations, Yahraes and Prestwich suggest that the higher incidence of LD among boys may be attributed to the fact that the nervous system of boys tends to develop more slowly. Regardless of it's cause, male preponderance is an established fact, one which has led several investigators (Emery, 1973; Hirst, 1967; Jansky and de Hirsch, 1972) to conclude that different screening measures are needed for each sex.

III. DEFINITIONAL COMPONENTS

In attempting to identify the population of the learning disabled, Brenton and Gilmore (1976) point out that much of the problem seems to lie in converting definitions based on theoretical concepts into quantified terms for practitioners of special education. If a definition is to serve as a point of departure for remediation, each of the definitional components must have operational application for educators at all levels of involvement.

As according to Kerlinger (1973), an operational definition is one which ascribes meaning to a concept or construct by specifying the operations which must be performed in order to measure that concept. In order to illustrate, from a review of the literature, the approaches followed by LD specialists in attempting to meet Kerlinger's criteria, those components most commonly found in current definitions will be discussed in terms of their operational potential.

Before doing so, it is important to note that different approaches to LD identification employ different definitional components to outline diagnostic requirements. Whether a definition emphasizes a neurological, process or academic component, and disregards others depends on whether its author considers LD to be neurologically caused, does not recognize any cause beyond process dysfunction, or views cause to be irrelevant to the basic fact of poor academic performance, respectively. Generally, any of the numerous positions taken by specialists concerning identification may be expressed in some combination of the six components to be presented here – the intelligence, process, academic, discrepancy, neurological and exclusion components.

Departing from this basic assumption concerning procedures currently used in the educational identification and assessment of children with learning disabilities, there follows a general description of how each of the definitional components contribute to the diagnostic process. Each component will be presented, within a framework in which the identification procedures and diagnostic tests, which have operational value, will be discussed for each. This outline is not intended to provide any comprehensive examination of the varied and divergent procedures and tests used by professionals. Rather, the definitional components are listed in order to organize a general discussion of prevalent practices, and to provide a basis from which to deal, in brief, with the relevant issues.

1. **Intelligence component** – in most cases, the intelligence component is included in definitions, either in the phrase "average or above average intelligence", or in the exclusion of mental retardation, in order to ensure that children whose learning difficulties are secondary to mental subnormality are not misdiagnosed as learning disabled. As Norman (1977) explains, "the criterion for the appropriate IQ functioning level may be general or vague, or may be specific and definite. The criterion associated with this IQ assessment procedure might be descriptive; that the child demonstrate "adequate" or "normal" intelligence, or operational; that the IQ must be ninety or above on an individually administered IQ Test". However, if a definition is to provide direction for the identification of the LD child, the intelligence component must be accompanied by specific operational criteria. That is, it should indicate a level of intelligence above which a diagnosis of LD may be accepted, and recommend the standardized test from which to determine that measure of intelligence.

Problems associated with the intelligence component are primarily responsible for the inconsistency in reported estimates of LD incidence. For one thing, there is much disparity of opinion concerning which test most accurately measures intelligence. According to Gearheart (1977), three major tests are commonly employed to obtain an intelligence quotient – one of the three Weschler tests or scales (the Weschler Preschool and Primary Scale of Intelligence, WPPSI; the Weschler Intelligence Scale for Children, WISC; and the Weschler Adult Intelligence Scale, WAIS, the Stanford-Binet, and the Illinois Test of Psycholinguistic Abilities (ITPA). Norman (1977), in a study of the characteristics of LD students enrolled in Child Ser-

vice Demonstration Centers (CSDCS) throughout the United States, found that four intelligence tests were used to determine IQ level – WISC, Binet, Slossen and Picture Peabody Vocabulary Test (PPVT). Because these tests yield different IQ scores, and because the IQ score viewed to be synonymous with normal intelligence on any one test differs from author to author, it is impossible to define this component operationally in terms which render it universal reference. Norman, for example, found that the WISC, Binet, Slossen and PPVT yielded mean scores of 91.5, 97.7, 98.5, and 99.9, respectively, and that there is a significant difference between the WISC Verbal (VQ-89.6) and Performance (PQ-95.4) IQ means. This latter finding, which is consistent with other reports (Rudel and Denckla, 1976; Rourke et al, 1973) led the author to conclude that the Performance IQ is a better reflection of intelligence than the Verbal, and that WISC full scales scores are inappropriate as operational criteria. Hammill's (1976) out-off score of 90 "on either the VQ or the PQ" might thus be used to support two considerably different estimates of incidence. Furthermore, a comparison of Hammill's criteria, to that specified in Ashlock and Dolan's (1976) operational definition – and IQ of at least 80 on a test such as the HISC – would result in an even wider margin in the number of children identified.

Despite the fact that there is some inconsistency in interpretation, specialists generally agree that normal or above intelligence is essential in diagnosing learning disabilities. Some authors have recently expressed the concern that there is widespread abuse of intelligence as a selection criterion in that children below normal intelligence are frequently accepted in learning disability programs. Kirk and Elkins (1975), in another study of CSDCs, found that the children enrolled had lower IQs than the normal population and concluded that too many children labelled learning disabled were actually slow learners. Similarly, Norman (1977) has suggested that "the use of the highest possible IQ score to reflect 'normal' intelligence should be investigated further".

Norman (1977) further points out additional factors to be considered in defining intelligence operationally; the results of his study indicate that the criteria of IQ is influenced by age (IQ decreased with age), ethnic origin (i.e., blacks scored lower than whites); and residency (urban students scored lower than suburban or rural), among other factors. Although the cultural bias inherent in standardized intelligence tests, and their potential for misuse warrant consideration in the diagnostic process, they are well documented in the literature and will not be discussed here.

Finally, it is emphasized, throughout the literature, that although specific criteria of intelligence are essential in directing the diagnostic process, the unique characteristics of the individual child demands that educational practice allows room for some flexibility. Borderline IQ scores, for example, of children who otherwise fully satisfy the requirements for a diagnosis of LD would not be denied special services on the basis of that criteria alone.

2. Process component – the processes representing the major areas of deficit responsible for the learning problem assumes various forms in LD definitions. For NACHC (1968), they are "the basic psychological processes involved in understanding or in using written or spoken language". McIntosh and Dunn (1973), in their definition of major specific learning disability (MSLD) refer to a "specific, basic, learning process involving perception, conception, or expression, associated with the areas of oral and written language, or mathematics".

Process disorders are a major component of most definitions of LD, yet they represent a very nebulous area. Those who advocate defining LD in terms of process deficits commonly recognize a correlation between the presenting academic difficulty and underlying perceptual, integrative, or expressive dysfunctions (Bateman, 1967). However, although three main areas are stressed-perceptual, motor and language function-there is much disparity of opinion concerning those composite operations considered to be involved in these central processes. The various interpretations of areas of deficit found in the literature differ according to the theoretical orientation of the author.

Frostig (1964), for example, emphasizing visual perceptual function, views LD to be a reflection of disorder in any one of five specific skills – eye-motor coordination, figure-ground

perception, constancy of shape, position in space, and spatial relationships. In order to identify which of those areas is affected in learning, the Developmental Test of Visual Perception (DTVP; Frostig, et al, 1964) was developed as a testing instrument to measure deficits in each of these five areas.

Similarly, Kirk (1972), viewing certain psychological and linguistic abilities to be basic to academic achievement, developed a battery of 12 subtests (LTPA; Kirk and McCarthy, 1968) to identify specific psycho-linguistic correlates of LD.

Sabatino and Foster (1974, 1976), Chalfant and Schefflin (1969), Minskoff, Wiseman, and Minskoff (1972), and Mylkebust (1968) are among others who have formulated different hypotheses of the processes involved in learning disabilities and have proposed different diagnostic strategies for identifying which of these is responsible for the learning difficulty. According to Myers and Hammill (1976),

"It is doubtful whether authorities in the field could ever agree on their (psychological process) existence, identification, nature, or importance. To some professionals, these processes involve such factors as memory closure, and feedback. To others, they are the psycholinguistic dimensions . . . To others, these are the skills that comprise particular abilities . . . To yet another group, they imply the transmission functions."

Thus, due to the vague nature of the concept of a process disability, the operationalization of this component for the purpose of identification presents a particular problem. Related to this, many of the tests used to yield the data required for operational criteria are less well standardized, as normative measures, than the common tests of performance (Haring and Bateman, 1969) and have been seriously questioned in recent investigations (Hammill and Weiderholt 1973; Simensen and Sutherland, 1974; Thorndike, 1973). Critics of the process approach to LD generally focus their attack on the presumptive relationship between certain perceptual functions and certain academic abilities (Larsen and Hammill, 1975; Silverman and O'Bryan, 1974) and to the invalidity of perceptual subtests which fail to identify process disorders in the areas they purport to assess (Newcomer et al, 1975). The problem of identifying process deficits is indicated in Larsen et al (1976) study of "The Use of Selected Perceptual Tests in Differentiating Between Normal and Learning Disabled Children", where it was found that of five commonly used perceptual tests (Bender Visual-Motor Gestalt, Wepman Auditory Discrimination Test and the Visual Sequential Memory, the Auditory Sequential Memory, and Sound-Blending subtests of the ITPA), only the Bender test differentiated significantly between the normal and LD groups.

In the face of such persuasive findings, the process factor continues to be the one most prominent component of definitions currently in use (Li, 1977), appearing in 83% of LD definitions (Vaughan and Hodges, 1973). Accordingly, although specialists must recognize the limitations of the tests they chose to administer and exercise caution in interpreting results, they must nonetheless accept that they represent one of the few available means of quantifying process disorders, however unreliable.

Operationally, the criteria outlined in the process component provide direction for the diagnostician in narrowing the focus of assessment. The operational criteria provided in the intelligence component serve as a guide for assessing global aspects of intelligence, usually for classification or categorization. Then, at this stage in diagnosis, the preliminary indications of difficulties suggested by the intelligence tests serve as a basis for analyzing the child's functioning within specific subskill areas (Lerner, 1976). Depending on the process involved, certain diagnostic tests, subtests, or test batteries are used to derive information about specific mental abilities.

Visual-motor functioning, for example, may be assessed using the ITPA subtests of visual decoding, visual-motor association, motor encoding and visual-motor sequential; the Draw-A-Man Test; Memory for Designs Test; the Benton Revised Visual Retention Test; Beery Buktonica Visual-Motor Integration Test; Purdue Perceptual Motor Survey, etc. . . (Haring and Bateman, 1969).

This is only one example of a selection of tests recommended for the purpose of focusing assessment on a particular area of potential dysfunctioning. In a similar manner, regardless of how process disorders are classified in a definition, or which process is of interest to the diagnostician, a corresponding classification of appropriate tests may be found in the literature.

Sabatino and Foster (1974), recognizing that "Available measures often rely on unsatisfactory normative samples, unstandardized administration procedures, and nebulous conceptual basis," have developed and standardized two instruments designed as measures of perception. These are the Test of Auditory Perception, which assess three areas of auditory perception, and the Test of Visual Perceptual Discrimination and Memory (VPDM), which assesses visual perception and visual memory skills. Using these two tests, and the Bender Visual Motor Gestalt Test (BVMGT) as measures of visual-motor development, Sabatino and Foster (1976) recommend a procedure whereby the process component may be rendered operational. They suggest that data from these perceptual measures be converted to standard scores such that a score of at least minus one standard deviation (-1 SD) is necessary for the demonstration of a perceptual problem. A child who scores below this cutoff point (which approximates the 16th percentile of a normal distribution) is eligible for LD programming.

The literature contains few examples of operational definitions which require that specific tests are employed in analyzing processes. Rather, the process component is translated into operational terms which serve only as a general guideline to diagnosis. In most cases, one standardized criterion value is required for all of the process areas, however measured. The State of Florida, (U.S. office of Education, 1976), for example, includes the following process components in its operational definition:

Evidence of a disorder in one or more of the basic psychological processes: Based on a student's expected level of functioning (EA - $2MA - CA/3$), a score of less than $-2SDs$ in one process area, or a score of less than $1\frac{1}{2} SDs$ in three or more process areas. Process areas are defined as: 1. visual channel processes, 2. auditory channel processes, 5. sensory integrated processes.

In cases where the SD is not available, the following criterion may be applied: Based on a student's expected level of functioning (EA), a score of less than 70% EA in one process and, or a score of less than 80% EA in three or more process areas.

Regardless of the area of emphasis, or the means employed in establishing a process dysfunction, the assessment of processes represents one of the most important steps in operationalizing the definition, for it will determine the focal point of remediation. Underlying the concept of a correlated disability is the belief that, if there is dysfunction in a specific process, one may predict that the child will have difficulty in any task which demands the use of that process (Chalfant and King, 1976). Proponents of this view contend that knowledge of process deficits is therefore prerequisite to the development of instructional strategies.

As Goodman and Mann (1976) point out, "The field of learning disabilities is predicated on the assumption of specific process deficits." Despite this fact, those who employ a process component to define LD have few resources from which to express this in operational terms, and must rather rely on the operational strategies provided by those who have developed the process tests (i.e. Kephart, 1971; Kirk, 1972; Frostig, 1964; Sabatino and Foster, 1974). Even accepting the claim that these tests accurately measure specific process weaknesses, there remains the problem of arbitrarily choosing that amount of process disorder which qualifies as "deficit". Such tests do not, for example, specify the point at which perceptual function ends and dysfunction begins.

The problem, in the view of Goodman and Mann (1976), is that unlike academic failures, which is directly manifest in a child's performance, process deficits are secondarily inferred from test measures. The solution they propose is to use process tests, such as the ITPA and DTVP, as well as the more global tests, such as Weschler and Binet to assess "cognitive", rather than process functioning, the results of which are interpreted to determine specific dysfunctioning.

tional test performance, which indicate areas of a child's cognitive dysfunction, without attempting to identify which of the processes is involved.

Finally, certain issues relevant to the assessment of processes are more appropriately discussed within the context of their relationship to the academic and discrepancy components. Some authors, for example, view academic deficit as an alternative to process explanations of learning problems, while others consider the two to be inseparable. In either case, the discrepancy component is commonly used to operationalize diagnostic criteria.

3. Academic component - the academic component is included in LD definitions to stress the relevance of the problem to the learning process. Many definitions which focus primarily on process disorders also include an academic component to emphasize that in order to satisfy the requirements of LD, a process disorder must be manifest in an academic deficit. The NACHC (1968) definition states that "These may be manifested in disorders of . . . reading, writing, spelling, arithmetic". The Council for Exceptional Children (CEC; Barcsh, 1967) refers to "specific deficits in perceptual, integrational, or expressive processes which severely impair learning efficiency". Kass and Myklebust (1969) define LD as "significant deficits in essential learning processes . . . ; those revolving perception, integration, and expression".

These definitions generally employ the academic component to emphasize the causal relationship between process disorders and learning problems. In such cases, the academic component serves to operationally outline the educational information and measures required to identify those academic functions which have been disrupted by the established process dysfunctions, or conversely, which processes underlie established academic deficits. For example, a child who scores poorly on reading tests might be found to score poorly on measures of auditory closure or visual memory. (Bateman, 1967).

Sabatino and Foster (1976), who include both academic and process components in their operational definition, require that in addition to the process criteria previously discussed, that a child meet the following criteria for academic achievement deficit: deficit is defined as an inability to score above the 20th percentile on standardized achievement tests measuring proficiency in a subject area.

There are many (i.e. Hammill, 1976; Li, 1977; Valett, 1969; Vellutino and Tanzman, 1977), however, who are adamant in their view that LD should be defined exclusively in terms of academic deficit. Advocates of this approach are opposed to the whole concept of LD as a process disorder, and to any inferences of causality in LD definitions. Assessment, according to this approach, should not go beyond observable problems with educationally related tasks.

The literature provides numerous examples of definitions in which descriptive criteria of academic deficit is the central component. Valett (1969) for example, defines LD as "any specific difficulty in acquiring and using information or skills that are essential to problem solution". Farrald and Schramber (1973) view the learning disabled child as one who, "for whatever reason, consistently fails to meet the demands of the curriculum to which he is assigned". According to Rosner (1975) "LD, or any of its counterparts, applies to those children whose academic record in school cannot be explained in terms of impaired intelligence, emotional disturbance, or lack of motivation".

Definitions in which operational criteria of academic deficit are outlined are more variable, with reference to the measures accepted as indices of educational ability. Scores derived from tests of achievement, of performance in basic school subjects of specific academic skills, of readiness, or of general intelligence are variously expressed in such normative terms as mental age (MA), chronological age (CA), expectancy age (EA), grade level, or IQ. Hammill's (1976) academic criteria requires that scores be derived from tests of readiness, tests of language, and/or tests of achievement, depending on the grade level of the child:

1. Preschool and Kindergarten: performance of minus 1.5 SD on tests of readiness or language;
2. First and second grade: performance of minus 1.5 SD on tests of readiness, language or achievement;

3. Grades 3-7: estimate the grade the child should be in, according to CA. Divide the grade level by 2. If measured performance in an academic area is below that figure, he qualifies.
4. Grade 8 and above: students must perform at grade 4.5 or below on achievement tests.

The State of Florida's (U.S. Office of Education, 1976) operational definition bases its academic criteria on a student's expected level of functioning (EA) and requires that tests of a child's ability in certain academic areas be administered:

Evidence of academic deficits. Based on the student's expected level of functioning, a score of 70% EA or below for 3 to 6 years of school attendance; 60% EA or below for 7 to 9 years of school attendance; 50% EA or below for 10 or more years of school attendance, in one or more of the following academic areas: reading, writing, arithmetic, or spelling. For children in grades K-2, evidence must be presented that the student is achieving below his expected level on pre-academic tasks which require listening, thinking, or speaking skills.

Because of the confusion in establishing operational criteria, some authors have simply defined LD as the bottom 2% of underachieving children who are not eligible for other special education services (McIntosh and Dunn, 1973).

The diagnostic tools and techniques employed to determine whether a child satisfies the operational criteria for academic deficit are generally considered to be more objective and more reliable than those associated with psychological processes. Depending on the interpretation of academic deficit in a given definition, the diagnostician may be required to administer (as suggested by Faas, 1976; Haring and Bateman, 1969) tests of achievement: the California, Stanford, or Metropolitan Achievement batteries, the Wide Range Achievement Test, the Peabody Individual Achievement Test, tests of performance in basic school subjects: Keymath Diagnostic Arithmetic Test, The Stanford Diagnostic Arithmetic Test; Lincoln Primary Spelling Test, Phonics Knowledge Survey; reading tests: The Durrell Analysis of Reading Difficulty, Gates Reading Survey, Gray Oral Reading Test, Monroe Reading Aptitude Tests; Tests of readiness: The Anton Brenner Gestalt Test of School Readiness, Metropolitan Readiness Tests; or tests of specific academic skills: Boehm Test of Basic Concepts, the Valett Developmental Survey of Basic Learning Abilities, or Basic Concept Inventory.

Those who promote educational deficit definitions of LD view the purpose of diagnostic procedures to be the identification of weaknesses in school subjects, poor task performances or deficit skills in order that a remedial program for the direct teaching of deficits skills may be implemented. Accordingly, those who follow this approach stress the importance of informal methods of assessment, in addition to formal testing, in order to ensure all educationally relevant information is collected. "Planned behavioural observations" is one such technique in which a variety of observational data (i.e. motor abilities in use of pencil paper, response to noise) relevant to how a child approaches and attempts to solve problems is carefully observed and recorded (Gearheart, 1977). With reference to informal assessment procedures, DeGenaro (1975) provides suggestions as to how the classroom teacher may assess, through informal methods, the areas of visual discrimination and memory, auditory discrimination and memory, letter identification, writing the alphabet sequence, phonetic knowledge, toctual ability, reversals and rotations, verbal skills-oral, copying at near and far points, reading level, self-concept, eye hand coordination and written language, following directions, and gross motor skills.

It is within this general category of diagnostic approaches that the approach of task-analysis is placed. Frank (1973) specifies four steps to the sequence approach to task-analysis: 1) statement of learning task (behavioural objective); 2) list components or subskill necessary to meet these objectives and place these subskills in a logical teaching sequence; 3) test informally to determine the subskills the child can already perform; 4) begin teaching in sequential order the next skill on the task-analysis hierarchy.

The task-analysis approach to LD assessment and remediation has received much attention in recent literature (Ysseldyke and Salvia, 1974; Bateman, 1964, 1967; Engelmann, 1969) as a means of obtaining additional diagnostic information; as an approach to evaluation designed to lead directly to appropriate teaching. Those who promote its use contend that it has operational value in that it identifies operationally defined tasks in a sequential skills hierarchy. As Batemen (1967) suggests, task-analysis is "the process of isolating, describing, and sequencing . . . all necessary sub-tasks which when the child has mastered them, will enable him to perform the objective".

Operationally, however, the essential element of academic deficit criteria is the discrepancy factor. The following discussion thus further illustrates how academic criteria are translated into operational terms.

4. Discrepancy component - the discrepancy component, popularized by Bateman (1964) is considered by many to be the common denominator of LD. (Mercer et al, 1976). The many definitions which focus on discrepancy (Haring and Bateman, 1969; Kass and Myklebust, 1969; McIntosh and Dunn, 1973; Chalfant, in McDonald, 1968) vary little in their description of this factor; all view discrepancy between performance and potential to be the basic criterion in the identification of LD.

A review of the literature suggests that the discrepancy component, which only began to appear in LD definitions during the early sixties, was developed in response to the problems facing the field at that time. The absence of a quantified index of LD, the lack of educationally relevant formulations of LD, and a growing dissatisfaction with the etiological emphasis of prevailing definitions all appear to have contributed to the development of the discrepancy concept.

In examining the discrepancy definitions currently in use, two types of criteria or two strategies of operationalization roughly corresponding to two of the major LD approaches may be identified.

The first type of discrepancy is that which compares the difference between a child's estimated level of intellectual functioning, or potential, and actual academic achievement, or performance. This criterion is frequently the basis for operationalizing the academic deficit component in educationally-oriented definitions. (McCarthy and McCarthy, 1970; Kass and Myklebust, 1969; Kirk, 1972; Cauley, in McDonald, 1968).

The diagnostic procedures associated with the measurement of discrepancy between achievement and potential consist of comparing measures of academic ability, as derived from standardized tests of achievement or intelligence (i.e. Binet or WISC) and measures of academic potential, based on such variables as a child's mental age (obtained on intelligence tests), grade achievement scores (obtained on achievement tests) (McCarthy & McCarthy, 1970), expectancy age, chronological age, or grade level.

Myklebust's (1968) learning quotient (LQ) was developed as an index of discrepancy between achievement and performance, and is suggested as a method for quantifying LD with reference to three factors; mental age (MA), chronological age (CA), and grade age (GA). According to Myklebust, LQ is then the ratio between present achievement level (AA) and expectancy level (EA): $LQ = AA/EA$, where $EA = MA - CA - GA/3$. An LQ of 89 or less is considered to be diagnostic of LD.

Other formulas for measuring discrepancy between performance and potential include Harris' (1970) Mental Grade Method ($RE = \text{reading expectancy grade} = MA - 5$), Bond and Tinker's (1967) Years-in-School Method ($RE = \text{years in school} \times IQ/100 - 1.0$), and King's (1976) severe discrepancy level ($SDL = CA (IQ/300 = 1.7 - 25)$).

Still other recommended procedures are the computation of differential indices (Woodbury, 1963) and the Z-score discrepancy method (Erickson, 1975).

There are numerous problems associated with the use of discrepancy measures, due to the difficulty involved in obtaining reliable quantitative data on academic or intellectual "potential" a concept which relies on the assumption that a child's capacity for learning is measurable. Further to the fact that the very concept of IQ remains controversial, the question

of at constitutes a level of "potential" ability is an inherently nebulous issue (Salvia et al, 1974). There is much evidence for example, to support the contention (Hammill, 1976; Norman, 1977; Sabatino, 1976) that the WISC Full Scale IQ masks the strengths and weaknesses of LD students, and should not be used as a measure of intellectual potential. Furthermore, the use of mental age, which has been the most conventional procedure for determining potential, (Norman, 1977), has been strongly criticized for that purpose (Hammill, 1976). As Lerner (1976) speculates, "can a 9-year-old with an MA of 13 be expected to perform like a 13-year-old?"

Related to this is the problem of arbitrarily establishing a level of discrepancy which most closely approximates a "significant" difference between potential and function. In other words, what amount of discrepancy should be considered significant? Some authors (Bryant, 1972; Larsen, 1976) have suggested that there is a need to classify only severe cases of LD. Recognizing this problem, the U.S. Federal Government in 1976 adopted King's (1976) severe discrepancy level as an accepted formula for identifying LD. King's criteria, which arbitrarily established the 50% learning efficiency level as the cut-off for severe discrepancy, was subsequently dropped, in response to pressure from persons concerned with the inappropriateness of using a single formula for children of all ages, and the psychometric and statistical inadequacy of the procedure (Federal Register, 1977). In examining King's (1976) discrepancy level, and Zigmond's (1976) formula of learning efficiency (LE; a calculation which compares actual academic performance with expected potential based on mental age, and reports the results in terms of a percentage) which employ 50% and 60% cut-off levels respectively found that the negative correlation between age and LE and between age and discrepancy level was such that less severely disabled younger children were selected for programs, while a more rigid requirement was in effect for older children.

Many investigators have attempted to avoid the problems inherent in quantifying a level of potential through procedures which do not require the calculation of either mental age, or expectancy age. Rice (1970), for example, defines "significant deficit" as a standard achievement score (WRAT) of 15 or more points below the full scale IQ (WISC). Another such approach to quantifying the discrepancy between achievement and ability is Kline et al's (undated) formula which yields a numerical index of reading disability. His dyslexia quotient (DQ) is "designed to specify the degree of reading disability in a given child, irrespective of age, grade level, or intraschool factors." The DQ is calculated by determining the difference between reading performance (as expressed in grade-equivalent scores on the Iowa test of reading) and exact grade in school. If the reading score is greater than grade level, this difference is expressed as a positive value, and as a negative value if the reverse is true. A DQ of zero indicates the child is scoring exactly at grade level; a high positive is superior to grade level, and a low negative suggests a handicap.

Goodman and Mann (1976) recommend the following operational criteria to define academic discrepancy: "The students academic performance must lag 2 or more years behind his actual grade placement in basic math and language skills and in all cases, fall below the beginning seventh grade level." To meet this criteria, the difference between a child's grade placement, and reading or math achievement score must exceed 2 years, and moreover, the difference between this resultant discrepancy score and grade level must exceed 6 years. Although objections to the stringency (Thompson, 1970) as well as looseness (Weiderholt, 1975) of a 2 year differential have been raised, Goodman and Mann defend their discrepancy formula as one which avoids the problems of estimating potential, and which is sensitive to the variable of age.

Inevitably, such differences in interpretation has contributed to the inconsistency in estimates of incidence reported in the literature. Not only are methods of quantifying discrepancy markedly dissimilar, there is little consensus, within any one approach, as to how rigid or lenient criteria should be. Macy et al (1976), for example, suggest that although Myklebust's LQ is of value as a measure of discrepancy, a single cut-off value is inappropriate. Variable cut-offs, relative to student subgroups of different grade levels, gender, and subject areas are recommended.

Even a slight alteration in cut-off scores, however, can greatly influence the number of cases identified. This fact has been demonstrated by Myklebust and Boshes (1969) who found that in a large population of public school, a cut-off LQ score of 90 identified fifteen percent as learning disabled, and that when the cut-off was lowered to eighty-five, the percentage fell to around seven.

Despite its shortcomings, the discrepancy factor is frequently used to operationalize academic deficit criteria. In the operational definition of the State of Wisconsin (U.S. Office of Education, 1976), discrepancy between potential and grade level serves as the basic criterion of "significant reading deficit", as measured on tests of word recognition, or general reading ability, Wisconsin (U.S. Office of Education, 1976) is also a good example of how discrepancy scores are translated into measures of academic deficit. In this definition, three criteria of academic functioning are listed:

1. The student, when first identified, must have a significant discrepancy in achievement in two or more of the readiness or basic skill areas in math, reading, spelling, written language, including five motor at the primary level. Determination of the significant discrepancies shall be based on a combination of formal and informal individualized tests, criterion-referenced measures, and an analysis of classroom expectancies in basic skill areas.
2. A discrepancy must exist between the student's grade placement, and actual achievement in relation to the referent group.
3. Approximate ranges of discrepancy by grade level in determining discrepancy in achievement are listed (i.e. grade levels of kindergarten, (and 2 correspond to functioning levels of age 3 or below, K.O. or below, and 1.0 or below respectively, etc. . . through grade 12 and functioning of 5.0 or below). The number of years the individual has been in school must be considered.

The second type of discrepancy employed in operational procedures is characterized by intra-individual differences in performance. Although this index of discrepancy is less problematic than the first, in that it is not necessary to deal with the concept of "potential", it appears less frequently in operational definitions. This may be due, in part to the close relationship between the 2 types of discrepancy, which represent different means of achieving the same ends. Measuring the extent of disparity among mental abilities by comparing subtest scores provides the same basic diagnostic information as calculating the level of discrepancy between achievement and potential in each of the subtests; in both cases, a significant discrepancy indicates that a child is not performing at a level commensurate with his or her potential.

Intra-individual differences in performance, or disparities among mental abilities is accepted as a valid criterion for quantifying LD, and is used to operationalize both the process disorder and academic deficit components of definitions. This follows from the uneven growth pattern, or irregular development of mental abilities observed in learning disabled children. An analysis of the subcomponents of mental functioning often reveals that disabled learners are not developing in an even and regular manner. In these children, some subcomponents of mental functioning are very high, others are very low. Accordingly, such strengths and weaknesses are viewed to be characteristic of LD, and imparts a greater level of reliability to the discrepancy factor. (Kirk et al, 1978; Lerner, 1976).

Briefly, the strategy associated with this type of discrepancy consists of analyzing a child's sub-test scores to determine whether any diagnostic pattern may be discerned. Depending on whether a given definition is essentially diagnostic or educational in orientation, scores on sub-tests of achievement, sub-scores from process tests, or measures on sub-skill areas, academic abilities or task performance are derived using the appropriate instruments and are compared to determine whether any symptomatic differences between or among sub-tests scores is discernible.

Although a child's areas of strengths and weaknesses may be readily identified from numerous performance measures, the literature is most explicit in providing the diagnostician with guidelines for the interpretation of the WISC and ITPA test results.

According to Clements et al (1964), there are three WISC patterns which occur in the subtests performance of children with learning disabilities.

Bannatyne (1968, 1974) has suggested another technique for analyzing WISC test results whereby subtests are grouped into four categories: spatial ability (picture completion, block design, object assembly); verbal conceptualization ability (comprehension, similarities, vocabulary), sequencing ability (digit span, arithmetic, coding), and acquired knowledge (information, arithmetic, vocabulary). By comparing the child's average scaled score in each category, Bannatyne suggests that his procedure allows the diagnostician to obtain reliable information about the child's strengths and weaknesses. Although many investigators have criticized previous interpretations of WISC patterns, (i.e. Ackerman, Peters and Dykeman, 1971; Anastasi, 1968; Glasser and Zimmerman, 1967) Rugel (1974) has reviewed 25 studies of WISC scores of disabled learners, and concluded that there is much evidence to support the validity of Bannatyne's procedure.

Kirk et al (1968) define a discrepancy as one full standard deviation or more of scaled ITPA subtest scores from a child's own scaled mean score. Extensive consideration has been given to the use of the ITPA as an instrument for analyzing for discrepancies. Kirk and Kirk (1971) have provided guidelines for determining when a discrepancy is meaningful, and describe procedures for evaluating the significance of differences between individual and composite scaled scores. Paraskevopoulos and Kird (1969) have provided an even more comprehensive analysis of the statistical characteristics of the ITPA, and an explanation of methods for comparing differences between individual subtest scaled scores. In general, the differences between scaled scores are significant when the ranges of the standard error of measurement for the subtests do not overlap.

Informal assessment procedures are also used to establish whether there are discrepancies among a child's manifested abilities. These procedures include the use of teacher-made tests, observation of the child's learning behaviour, diagnostic teaching, error analysis of student's oral and written responses, and other special techniques (Kirk et al, 1978), through which the teacher or diagnostician may informally assess levels of discrepancy. Chalfant and King (1976) suggest that clinical judgement by component persons be used to support or refute the results of standardized testing. This entails careful observation of day-to-day tasks in order to obtain descriptive information which clearly identifies disparities in performance. An observant teacher who is familiar with the diagnostic criteria of LD may recognize that a child who is a capable and articulate speaker, but is unable to read, potentially requires special remedial programming.

5. Neurological component - the neurological component is included in definitions to recognize the general role of central nervous system (CNS) function in the development of learning disabilities.

Some authors are firm in their belief that there is a direct causal relationship between observed learning problems and underlying neurological dysfunction and that this relationship warrants mention in LD definitions, as a discriminating factor in diagnosis (Barsch, 1967; Getman, 1968; Johnson and Myklebust, 1967; Kephart, 1971; Wepman et al, 1975). Tennessee (U.S. Office of Education, 1976), for example, equates LD with a "dysfunction in the basic neurological processes" in its state definition. Cruickshank (1977), argues that a learning disability, specifically defines, is a manifestation of a perceptual processing deficit arising from deviations in CNS function, and regards definitions which ignore the concepts of either perceptual processing or the neurological base as being misleading (Li, 1977).

Despite the fact that the neurological component is incorporated into many definitions, research has been unable to provide definitive criteria capable of identifying LD on the basis of etiology, which would render this component operational. Accordingly, neurological components remain vague and open-ended, and the literature contains few recommendations

which are applicable to operational procedures. For this reason, specific strategies for operationalization are not delineated here; discussion will be limited to a consideration of those developments in neurological research which are most relevant diagnostically.

The orientation of current neurological research has been influenced primarily by the work of Strauss and Lehtinen (1947), Strauss and Kephart (1955), and others during the period which Wiederholt (1974) has termed the foundation phase, when interest focused on the nature and causes of specific learning disorders. As Hallahan and Cruickshank (1973) state the findings of Strauss and his associates "become an intrinsic element of the basic principles upon which the field of learning disabilities was constructed".

Strauss, extrapolating from his observation of similarities in the behaviour of exogenous retardates and persons with known brain damage, noted that the symptomatology of brain injury (BI) is also present in children with psychological and conceptual disturbances, "irrespective of their placement on the Binet Scale" (Strauss and Lehtinen, 1947). Strauss used BI to explain the symptoms of children with disturbances in thinking, behaviour and perception and recognized this syndrome as being outside the category of the generally mentally retarded.

Subsequently, Stevens and Birch (1957) proposed the term "Strauss Syndrome" to describe the child with CNS impairment who exhibited the following behaviours: 1) erratic and inappropriate behaviour, 2) increased motor activity, 3) poor organization of behaviour, 4) high levels of distractibility, 5) persistent faulty perceptions.

Thus, following the work of Strauss, assumptions of CNS involvement were based on the manifestation of behaviour characteristic of BI, in children of essentially normal intelligence, and who showed no signs of actual brain damage (Birch, 1964).

Clements (1966) used the term "minimal brain dysfunction" (MBD) to describe children of grossly normal intelligence with behavioural abnormalities supposedly associated with subtle CNS disturbances. Clements cited the following symptoms, in order of frequency of occurrence, as characteristic of MBD:

1. hyperactivity
2. perceptual-motor impairment
3. emotional lability
4. general coordination defects
5. disorders of attention
6. impulsivity
7. disorders of memory and thinking
8. specific learning disabilities
9. speech and hearing disorders
10. equivocal neurological signs and electroencephalographic (EEG) irregularities.

Clements postulates that these characteristics are manifested in children whose learning disorders are the result of MBD.

There are numerous theories presented in the literature, which have been formulated as explanations of the way in which neurological factors are involved in learning problems. One of the most prominent of these, as well as controversial, is Delacato's (1959, 1963) theory of Neurological Organization.

Delacato's approach is based on the premise that neurological development follows the biogenetic postulate that "ontogeny recapitulates phylogeny"; that individual human development repeats the pattern of man's evolutionary development. It is his contention that if man does not follow the sequential continuum of neurological development, he will exhibit problems of mobility and/or communication. In the progression toward full neurological organization, the human being progresses sequentially through higher anatomical levels of the CNS: 1) spinal cord medulla, 2) the pons, 3) the midbrain, 4) the cortex, 5) full neurological development; the establishment of cortical hemispheric dominance.

Based on the assumption that learning problems represent a disruption at some level of sequential development, the Doman Delacato Development Profile (Doman, Delacato, Doman, 1964) was later developed as an instrument to examine existing behaviours in order to determine the level at which development has been disrupted. The therapeutic approach proposed for the treatment of identified developmental disorders consists of "patterning" the motor abilities of the child (Delacato, 1966; Doman et al 1967). In patterning, those neurological stages that are found to be underdeveloped are overcome by engaging the child in activities designed to develop these levels of neurological growth, (Lerner, 1976).

Although the Doman-Delacato theory received wide recognition between 1960 and 1965 (Gearheart, 1977), and a number of reports of the success of the method have been presented in the literature (Delacato, 1966), ten professional groups jointly endorsed an "official statement", in 1968, which was highly critical of "The Doman-Delacato Treatment of Neurologically Handicapped Children". Among these were the Canadian Association of Children with Learning Disabilities, the Canadian Association for Retarded Children, and the Canadian Rehabilitation Council for the Disabled, (Cruickshank, 1968).

Ayres (1965, 1966, 1968, 1972, 1973) has proposed a theory of CNS involvement in learning which, though less controversial, also supports an evolutionary view of development. Ayres maintains that learning is a highly complex function of the CNS. Simply stated, "Learning is a function of the brain; learning disorders are assumed to reflect some deviation in neural function" Ayres' (1972) work is based on the idea that the control of sensori-motor behaviour relies on basic neurophysiological integration and that improving sensory integration thus enhances the learning of children with problems in that domain.

The basic contention supporting the theories of both Ayres' and Delacato, that learning problems are neurologically based, also underlies the perceptual-motor theories of Barsch (1967); Cratty (1967, 1969, 1971), Frostig (1970, 1972), Getman (1965, 1968) and Kephart (1971). Similarly, Keogh (1971), postulates a neurological impairment hypothesis to explain the behaviour of the hyperactive, learning disabled child: "this is a medically oriented explanation and assumes that there is a specific organic etiology".

There are many other variations on this central theme which have been popularized in recent research. The concept of learning disorders as representing a dysfunction at the level of the cerebral hemispheres, although conceived by Orton (1937), continues to be the subject of interest in recent investigations (Bryan and Bryan, 1975; Galin 1976; Geschwind, 1968; Ketchum, 1967; Sperry, 1968; Teuber, 1967). This hypothesis was supported in the findings of Rourke et al (1973) in a study of lateralized and non-lateralized motor deficits in learning disabled children.

As is characteristic of all LD issues, there are many who find the concepts of cerebral dominance, mixed laterality, or nondominance untenable (Ketchum, 1967). According to Money (1966), "A great deal of material about mixed dominance adds up to make sheer anatomical nonsense".

Within the general realm of brain research, certain discrete neurological entities have been identified, such as the Gerstmann syndrome (right-left disorientation, finger agnosia, and anomalies in writing and arithmetic, related to a dysfunction of a circumscribed area of the parietal lobe), but apart from a great deal of non-specific evidence of neurophysiological involvement in LD, the attempt to relate learning disability to brain function has not been illuminating (Hackney, 1976).

Another area under investigation is the relationship between biochemical imbalances, and brain function. Departing from the premise that mental processes are affected by the orthomolecular environment of the brain, much research has been devoted to the study of the way in which chemical properties play a role in thinking and behaviour, and the identification of factors which may potentially interfere with this biochemical influence. Research indicating a causal link between nutrient deprivation and impaired learning function is reported by Birch and Gussow (1970), Cott (1972, 1974), Cravioto (1972) and Pauling (1968) have established that there is a biochemical basis to impaired ability to learn and that this relationship is governed by nutritional factors.

Feingold's (1975) theory of food additives as an explanation of hyperactivity has recently received much attention in the professional arena. Dunn (1973) has found that many learning disabled children are hypoglycemic, a condition arising from poor nutrition.

Related to this, Crook (1974) believes that behaviour and learning problems may be caused by allergic reactions to foods, which adversely affect the nervous system. Similarly, Wunderlich (1973) has described a "neuro-allergenic syndrome", which results from various food-related allergies.

In another study of brain biochemistry, Rossi (1972) has discussed the possibility that some forms of learning disabilities appear to be based on constitutional, genetic neurochemical dysfunctions. Support for this position is provided by Silver (1971) who, after studying 556 selected children, discovered familial patterns in children with "neurologically-based" learning disabilities. (Myers and Hammill, 1976).

In general, there is increasing evidence to support the claim which commonly accepted by each of these authors - that biochemical and neurophysiological integrity is essential to optimal learning. However, a review of the literature suggests that explanations of LD etiology remain theoretical; research has not been able to specify the complex nature of physiological function in terms which allow specific learning problems to be attributed to certain identifiable biochemical or CNS causes. Accordingly, it is presently impossible to diagnose LD on the basis of neurological criteria.

Inevitably, the effect of this overwhelming uncertainty surrounding etiology extends beyond the level of theory, and is equally evidenced in problems of neurological assessment. Although research has made some progress in recent years, in terms of determining the significance of certain neurological findings, the same lack of agreement and contradictions in reported results prevails.

Medical studies have been able to delineate, with some degree of accuracy, reliable criteria for identifying those children whose learning problem is accompanied by overt signs of CNS disorganization. That is, the conventional neurological examination is capable of detecting "hard" signs of CNS impairment (i.e. motoric or convulsive involvements).

The learning disabled child, however, is more likely to manifest minimal, subtle, refined deviations, or "soft" signs (i.e. distractibility, awkwardness, impaired spatial orientation) which the neurological exam fails to uncover (Lerner, 1972). Moreover, soft signs are commonly manifested in children who are non-learning disabled. This point has been demonstrated by Myklebust and Boshes (1969) who found that their 23 item pediatric neurological exam was capable of differentiating between normal and LD groups on the basis of hard signs, but that soft signs were found to occur in almost equal proportions.

As several studies (Hart, 1974; Yuckovich, 1968) point out, the presence, or absence of soft signs must be interpreted with caution; it is often difficult to distinguish, on the basis of soft signs, learning problems which are neurologically based, from those which are non-neurological, or a lag in maturation from a CNS dysfunction.

The essential of the neurological examination for the purpose of diagnosing LD, are outlined by numerous specialists (Clements, 1966; Crichton et al, 1972; Cruickshank, 1977; Lerner, 1976). Briefly, this exam consists of recording a medical history, an examination of cranial nerves, an assessment of all the components that control motor function, and EEG recording, and biochemical, endocrinological and genetic evaluations, if necessary (Lerner, 1976).

The significance of EEG abnormalities is subject to the same controversy as soft signs. One interesting recent finding, however, suggests that a common clinical abnormality in learning disabled children is an excessive amount of slow-wave activity and a slower than normal response to stimuli, as indicated on the brain wave pattern (Satterfield et al, 1973; Shields, 1973). Although, this finding is basically consistent with the findings of Muehl and Forrell (1973-1974), in that this study showed a high incidence of EEG abnormalities in a group of

disabled readers, the results indicated that the disabled readers with abnormal EEG patterns were, as a group, better readers than disabled readers with normal EEG patterns.

Many attempts have been made to derive evidence of CNS involvement in LD from neuropsychological techniques. Although psychological tests and examinations provide only theoretical information about neurological correlates, their usefulness "lies in their capacity to extend and quantify the neurological examination in the sense that they permit a relatively accurate delineation of the psychological correlates of neurological impairment" (Crichton et al, 1972).

Just as the symptoms manifested in children with known neurological disorder became diagnostic of the Strauss syndrome, or minimal brain dysfunction, in the absence of neurological confirmation, the assumption underlying neuropsychological methods is that the psychological test performance of children with known CNS dysfunction may be used to demonstrate CNS involvement in non-confirmed cases. On this basis, numerous neuropsychological tests and test batteries have been developed which purport to measure neurological involvement.

Among these there are many which are essentially developed from perceptual tests, such as the use of the Bender Gestalt, the Goldstein Scheerer Tests, the Kohs block sub-test of the WISC for diagnosis of organic involvement (Frostig, 1961). The "psychodiagnostic" method designed by Mark (1966) is premised on the contention that MBD affects the thinking or cognitive functions of the CNS. Accordingly, he has outlined a procedure for identifying "Organic Learning Disabilities" from a "Formal Test Battery" which includes the Binet, WISC, and Academic Achievement Tests. In as much as perceptual tests are generally deemed inappropriate for the purpose for which they were designed, their extrapolation as neuropsychological instruments has inevitably aroused much criticism (i.e. Stott, 1974). Despite this fact, recent research has been able to lend some support to the argument that CNS function is reflected in perceptual test performance.

Salzarulo et al (1972) for example have demonstrated that the Bender Gestalt and the Berges-Lezine Test may be used to establish a relationship between neurological signs, corresponding to hypothetical brain damage, and spatial disorders in learning disabled children.

The Digit-Symbol Modalities Test (Smith, 1968), according to its author, was developed for two specific purposes: 1) to provide an effective and economic instrument for screening apparently normal children for learning and other central disorders. 2) to contribute to definitions of the nature of defects resulting from brain lesions and reflected in other impaired neuropsychological test performances. The Lincoln-Oseretsky Test of Motor Performance (Sloan, 1955), a test of a wide range of neuromuscular skills, has been used by many investigators (Hurwitz et al, 1972; Pyfer and Carlson, 1972) to assess neurological status. Similarly, the Southern California Kinesthesia and Tactile Perception Tests developed by Ayres (1966) are used to evaluate intersensory integration. Halstead (1947), Reitan and Heinman (1968), Crinella and Dreger (1972), Crinella (1973) and Connors (1972) are among others who have developed strategies for the analysis of underlying neurophysiological mechanisms, from which a significant degree of concurrence between neurological and psychological influences can be established.

In addition to tests and test batteries which are basically perceptual in design, and thus provide only inferential information, other neuropsychological techniques have been developed which also incorporate veritable neurological measures. Zedler (1968) describes a screening procedure in which relationships between protocol scores (based on child's behaviour during testing, WISC subtest scores, and Medical Examination scores are statistically evaluated to yield a "detection instrument", from which a "most sensitive" measure of quantifiable, minimal, neurological impairment may be derived. In a follow-up study reported by Eaves et al (1974), a screening test consisting of psychological, neurological, and academic measures was found to have accurately classified over 70% of the kindergarten subjects tested. Only 11% of the subjects diagnosed as MBD proved to be ready for grade 3, as contrasted to 86% of the normals. Shields (1973) presents an approach to the neurological study of children

in which specialized measures of brain functioning (i.e. EEG) are related to specific learning processes measured from perceptual tests. On the basis of these two measures, comparisons of LD and normal children revealed that there are neurological differences in children with learning disabilities and that these are evidenced in perpetual test performance.

In the area of neuropsychological testing, the most extensive investigations of the validity of diagnostic criteria have been conducted by Myklebust (1973a, 1973b). In two studies, ophthalmological, neurological, EEG, educational, and psychological measures of learning disabled children were evaluated, leading to the conclusion that neurological information is critical to the identification and diagnosis of LD.

In general, the literature suggests that although the complex relationship between CNS function and LD is not yet clearly understood, the evidence to support neurological etiology is convincing. Luria's (1966) contention that specific learning problems are attributable to certain identifiable defects in neural functioning, is typical of the thinking in recent research. One may reasonably conclude, as Myklebust and Boshes (1969) suggest, that the development of more precise and sensitive neurologic tools will allow definitions to classify LD types according to causes. The present state of neurological research is well represented in McGrady's (1970) analogy, which suggests that techniques we use are so gross, it's like fishing for sardines with a whale net, "You see, a lot of sardines are there, you just don't catch them".

For this reason, few definitions require evidence of neurological disorder as a necessary condition in the diagnosis of LD. The operational definition of Goodman and Mann (1976) is exceptional in its stipulation that "The student suffers some degree of neurological dysfunction". Generally, it is inferred that in children who exhibit typical LD symptomatology a diagnosis may be accepted and underlying CNS disorganization may be assumed.

Even those investigators who have chosen to concentrate on the analysis of overt behaviour, disregarding underlying neuropathology (i.e. Capabianco, 1964; Valett, 1969) do not deny that CNS may be involved in LD. Advocates of an approach which focuses on performance and capabilities rather than on neurological inferences are not opposed to the study of CNS etiology, but to the use of etiological information as a basis for classification.

Regardless of the value assigned neurologic information, or whether it is given consideration to the diagnosis and remediation of LD, a medical evaluation, including a neurological examination, is a standard requirement for admission to most LD programs. Gordon and Levesque (1976), in their report of visits to schools for children with specific learning disabilities (Pine School, Vt.; Eagle Hill School, Mass.) point out that candidates for admission are required to present comprehensive neurological and medical reports. Hackett (1975), from a survey of SLD programs in Western Ontario, concluded that "once one gets beyond the basic educational diagnosis, it would appear that hospital centers constitute the only objective and comprehensive diagnostic service".

6. Exclusion component - The exclusion component serves to delineate, on the basis of etiology, those characteristics of learning problems which do not qualify as LD. Generally, it refers to the exclusion of learning problems which are caused primarily from such handicapping conditions as mental retardation, visual impairment, hearing impairment, sensory or motor disability, emotional disturbance, inadequate instruction, cultural disadvantage, or environmental deprivation. This follows from the assumption that learning problems resulting directly from these factors require remedial strategies which differ distinctly from the treatment necessary for the remediation of learning disabilities. This position is validated in the investigations of Sabatino and Hayden (1970) which compared LD and mentally retarded pupils, and of McCarthy (1969) and Barr and McDowell (1972) with LD and emotionally disturbed children. Their findings indicated that LD children, as a group, do differ significantly in academic, affective and cognitive performance than the other two groups, and as a result, each group has unique educational needs.

While some definitions recognize that children who are blind, deaf, mentally retarded, etc. may also be learning disabled, most definitions employ the exclusion component to distinguish between LD and categorical disabilities. Clements (1966) for example, states that

"similar symptoms may or may not complicate the problems of children with cerebral palsy, epilepsy, mental retardation, blindness, or deafness". For Cruickshank (1977), LD may occur at "any level of intellectual functioning" and is "characterized by numerous overlapping subsets". The NACHC definition, on the other hand, is one of many which eliminates visual, hearing, and motor handicaps, mental retardation, emotional disturbance and/or environmental disadvantage, when they are the primary causes of a learning problem.

The operationalization of the exclusion component consists of establishing eligibility criteria, appropriate to each of the causal agents specified in the definition, which disqualify those learning problems viewed to be outside the category of learning disabled.

Chalfant and King (1976) explain that:

"When a child is referred for individual assessment, the status of the child's vision, hearing and motor performance, health impairments, level of intellectual functioning, environmental factors, and social-emotional adjustments are usually considered. . . Alternatives for identifying these problems include: a) observation, b) diagnostic teaching, c) psychological tests, d) referral for medical examination, e) psychiatric evaluation.

Regardless of the means employed, the operationalization of the exclusion component requires that information is obtained which indicates whether or not the specified exclusion criteria are satisfied. Essentially, the assessment of learning problems results in a "diagnosis-by-elimination"; a diagnosis is indicated by systematically ruling out other causative factors (McCarthy and McCarthy, 1970).

Mental retardation, for example, may be ruled out as the cause of learning problems by operationally applying certain intellectual criteria; children who score below a designated cut-off score on standardized tests are excluded.

Learning problems related to visual or hearing impairment are screened out by specifying a minimum level of deficit in these sensory processes above which a diagnosis of LD may be accepted. To determine whether a child satisfies such criteria, Underwood (1977) points out that "visual and hearing acuity testing (by qualified medical practitioners) must be done to preclude sensory deficit". In this manner, eligibility is reserved for those children who have no measurable degree of impairment, or who are affected by a hearing or visual deficit determined to be insufficient to interfere with, or be the cause of the accompanying learning problems. Hammill (1976) suggests that "students with significant learning losses, especially if in the speech range, or with visual acuity of less than 20/70 in the better eye after correction" are not usually diagnosed as LD.

Ophthalmological and audiological examinations are of particular importance in view of the differing educational needs of children who are learning disabled and children who are sensorily handicapped (McInnis, Kleffner and Goldstein, 1956). Moreover, their importance is evidenced in the difficulty confronting clinical differential diagnosis when attempting to distinguish between visual impairment and visual dyslexia, or between hearing loss and auditory aphasia (Goldstein, Landau and Kleffner, 1958). As Olsen (1961) explains: "Those who cannot hear (deaf) and those who seem unable to gain meaning respond to an audiometric examination in a similar fashion."

In examining this problem, Olsen found that the ITPA is capable of differentiating between these two groups and thus suggests that this instrument be used to corroborate the final diagnosis.

The exclusion of children whose problems are the result of cultural disadvantage presents the greatest difficulty. Specific learning disabilities have also been found in a large percentage of culturally disadvantaged children (Kappelman, Kaplan and Gantes, 1969), an observation explained in terms of the predominance of factors capable of producing CNS alterations (poor nutrition, prematurity, etc.) which render this a high risk group (Newton, 1976; Birch and Gussow, 1970). Despite this fact, Myers and Hamill (1976) explain that "because some diagnosticians have difficulty distinguishing between disadvantaged and learn-

ing disability cases, especially those with mild to moderate problems, the deficits of many of these children have been mistakenly attributed to their disadvantaged state". Evidence of this is offered by Franks (1971) who studies a large sample of educable retarded and LD classes in Missouri and found that blacks made up 34 per cent of the educable group, but only 3 percent of the LD group. Similarly, Kealy and McLeod (1976) studies the relationship between socioeconomic status (SES) and LD diagnosis in 333 children in western Canadian urban public schools, and reported that 72.5% of the upper SES had been diagnosed, whereas only 35.2 of the total lower SES group had been identified.

In general, it is the task of the diagnostician to ensure that the evaluation process has utilized all available means to determine whether the learning problem is independent of handicapping conditions. The definition followed should outline the operational criteria which must be met to disqualify all problems other than LD.

CONCLUSION

The purpose of operationalizing each of the definitional components is to provide guidelines which diagnosticians may use to accurately identify the learning disabled child. Presently, there are many different approaches to definition, none of which are exempt from the numerous problems inherent in operational strategies. For one thing, although the diagnostic tests currently used may contribute to an understanding of a child's problem, their validity has always been questionable (Coles, 1978).

The neurological approach is viewed to be unresponsive to real educational needs; the diagnostic approach is questioned for its presumptive relationship between perceptual functioning and academic abilities, and the educational approach is accused of failing to recognize LD as distinct from other learning problems.

Given the unresolved differences between these three approaches, and the problems presented by the definitional components discussed here, it is inevitable that specialists are as yet unable to reach any consensus as to the incidence of LD.

As Macy et al (1979) points out, "Even though operational definitions may appear to have a fair degree of face validity, the final test must be the extent to which it reflects the underlying theoretical definition and meaning of learning disabilities". The authors go on to emphasize "a major pitfall in attempting to derive an operational definition of a multi-dimensional construct such as learning disabilities".

The problem is that this multi-dimensional construct is presently understood on the basis of a body of hypothetical knowledge. For example, research has provided convincing evidence of the influence of neurological factors. However, it remains insufficient to allow for a purely neurological approach to definition and diagnosis.

Essentially, although all of the six components presented in this review are important for their contribution to an understanding of LD, this contribution must be carefully weighed before any may be included as a criterion for definition.

Recently, Kirk and Gallagher (1979) have suggested that there are only three criteria which may be used to describe the learning disabled child: 1) discrepancy between abilities, or between potential and achievement; 2) an exclusion factor; and 3) a special education criterion.

The definition they propose is as follows:

A specific learning disability is a psychological or neurological impediment to spoken or written language, or perceptual, cognitive, or motor behaviour. The impediment (1) is manifested by discrepancies among specific behaviours and achievements or between evidenced ability and academic achievement, (2) is of such nature and extent that the child does not learn by the instructional methods and materials appropriate for the majority of children and requires specialized procedures for development, and (3) is not primarily due to severe mental retardation, sensory handicaps, emotional problems, or lack of opportunity to learn.

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Extract from

French-Speaking Exceptional Students' Programs and Needs

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INTRODUCTION

This monograph was written in order to introduce teachers, administrators and specialists to the field of special education.

This review of the behaviours and characteristics of the exceptional child is sufficiently thorough so that those who work in this area may become familiar with the theory and research which must underlie any appropriate program of instruction.

This review is composed of the following five major sections:

- 1) Behavioural exceptionalities
- 2) Communication exceptionalities
- 3) Intellectual exceptionalities
- 4) Physical exceptionalities
- 5) The multi-handicapped

For ease of presentation of each of the above sections, each one is developed in the identical sequence which we believe will more easily permit the reader to comprehend the difficulties of special education. The sequence is the following: definition and classification; incidence; causes; identification and assessment; educational needs.

I. BEHAVIOURAL EXCEPTIONALITIES

A. Definition and Classification

In general educational terms, a behavioural exceptionality (BE) may be simply described as a pattern of behaviour which deviates from the norm, and which is accompanied by an academic problem directly related to that deviation.

For purposes of definition and classification, however, the category of behavioural exceptionalities must be understood in terms of the more specific sub-categories it represents. According to the literature, this delineation of sub-categories requires that consideration be given to both the internal and external dimensions of BE. That is, the classification of behavioural disorders must distinguish BE types in terms of underlying dynamics: problems which arise from disturbances within a child's own personality, and problems which develop in response to external factors; and in terms of the effect of the BE: problems which interfere with the child's own personal growth and development, and problems which are defined from their influence on other persons.

Kirk (1972), for example, defines a behaviour disorder as "a deviation from age-appropriate behaviour which significantly interferes with 1) the child's own growth and development and/or 2) the lives of others" (p. 389), and suggests that there are two types of such behaviour: emotional disturbance (ED), and social maladjustment (SM).

This distinction, according to Kirk, follows from differences in the behaviour characteristic of each. The ED child is one who is characterized by inner conflicts, tensions and anxiety, whether or not his expression is disruptive to others, and which may result in neurotic or psychotic behaviours. The withdrawn, depressive, over-inhibited, or hypersensitive child, for example, would be included in this category.

In contrast to ED, which is defined in terms of its effect on the child's own personality structure, SM must rely wholly on some external reference in order to qualify as an exceptionality. SM is defined in terms of social expectations of individual behaviour; the severity of an SM is determined from the extent to which it is disruptive to others, and the extent to which it conflicts with the standards imposed by society. Although all SM children display socially unacceptable behaviour, some may be socialized within their peer group, while others are unable to gain acceptance from peers. This category includes children who exhibit aggressive, anti-social, psychopathic, and delinquent behaviours.

The literature provides several examples of variations on the basic theme expressed in this traditional dichotomy of behavioural exceptionalities. Cruickshank (1975) defines the BE child as "a disturbed pupil who is persistently unable to cope with reasonable school environment even though expectations are geared to his age or potential" (p. 556). Furthermore, he suggests that his behaviour may be:

- 1) so disrupting as to violate the rights and educational growth of his peers, or he may,
- 2) manifest social withdrawal, and/or,
- 3) require an inordinate amount and depth of teacher involvement (p. 556).

In terms of the behaviour observed in classification 1) and 2), these represent the categories of SM and ED, respectively. The third refers to degree of severity, and may be integrated into either of the first two.

The Michigan State Department of Education (1973) defines an emotionally disturbed child as one who "is found to be emotionally disturbed through a complete medical diagnostic evaluation and:

1. Whose emotional disturbance appears to cause an education deficit; and/or
2. Is so disruptive within the regular education classroom that intensive education and therapeutic services are needed to assist in the reduction of disruptive behaviour; and/or

3. The child has a serious pathology not exhibited by disruptive behaviour (withdrawn poor socialization patterns) (p. 8).

Again categories 2 and 3 roughly correspond to the traditional classifications of SM and ED; the first criterion refers to cause and may be applied to either, without the necessity of an additional category.

In any case, the traditional dichotomy of BE as comprised of ED and SM is one which continues to receive much support in the literature. The SEEC Report (The Canadian Committee, 1971) distinguishes between behavioural and social disorders which are equivalent to the ED and SM categories as presented here.

The Ontario Ministry of Education (1971) has provided a more explicit definition, within this same general framework:

Emotionally and or socially maladjusted refers to students who demonstrate one or more of the following characteristics:

- a) an inability to learn that cannot be explained by intellectual, sensory, or health factors;
- b) an inability to maintain satisfactory interpersonal relationships;
- c) inappropriate behaviour or feelings under normal conditions;
- d) a general, pervasive mood of unhappiness or depression;
- e) a tendency to develop physical symptoms, speech problems, pains, or fears associated with personal or school problems.

This category includes the emotionally disturbed child who displays anxiety, neuroticism or psychotic behaviour, and the socially maladjusted child who displays truant, delinquent, or other socially unacceptable behaviour (p. 23).

In summary, a review of the literature suggests that behavioural exceptionalities are comprised of two sub-groups: the emotionally disturbed, and the socially maladjusted. The former term is used to describe that group of behavioural disorders which arise from disturbances in the dynamics of the child's personality, and which exert their major influence on the child's own growth and development. Emotional disturbance encompasses behaviours which are mildly disordered, such as feelings of inferiority, self-consciousness, anxiety; moderate disturbances, i.e. personality disorders, neuroses; through to behaviours which are severely disruptive to the child's development, i.e. psychosis, acute depression. Essentially, ED is defined in terms of within-child variables; variables which both influence and are influenced by personality disruption.

Social maladjustment, in contrast, refers to behaviours which are inappropriate in social context. Behaviours are viewed as exceptional on the basis of their deviance from the social norm, and on the basis of their disruptive influence for other persons. It is the child's conduct, his ability to respond appropriately to the demands of the environment, which is the major determinant in identifying social maladjustment.

This notion of discrepancy between behaviour exhibited and behaviour expected is also commonly used to describe BE in general. According to Kirk (1972), both ED and SM are represented in the statement, "Behaviour disorders are the outcome of frustration resulting from the discrepancy between the child's capacity to behave, and the requirements of the environment" (p.396).

Similarly, the Celdic Report (Roberts et al, 1970) suggests that, when we speak of the child with an emotional and/or learning disorder we are referring to a situation where there is typically a persistent imbalance in the interaction between the child and his environment, and between his capacities and the demands both internal and external that are made upon him. It is this imbalance which prevents him from adjusting successfully to these demands.

... In behaviour terms, these symptoms reflect an underlying disruption in the process of adaptation and development (p. 21).

B. Causes

According to the Ontario Ministry of Education (1971), "Perhaps the major problem in dealing with emotionally and or socially disturbed children is that of identifying the underlying cause of their deviant behaviour as a prerequisite to treatments" (p. 23). This is of particular importance in attempting to distinguish between problems in which emotional disturbance is the primary causative factor, and those in which emotional disturbance (ED) is secondary to a problem of other etiological origin. The educational needs of the ED child, for example, and the needs of the learning disabled child who has acquired extreme behaviours as a result of an unrecognized disability, are markedly different.

An understanding of the possible causes of BE is thus essential to the treatment of the problem.

Although Stott's (1978) approach to learning problems does not specifically separate behavioural disorders from learning behaviours in general, he suggests that there are four basic forms of behavioural disturbances which may be responsible for learning failure. All of these are associated with handicaps of temperament, and represent the four core syndromes of the Bristol Social Adjustment Guides (BSAG; Stott and Marston, 1970; Stott, 1974): unforthcomingness (fear of novel experiences), withdrawal, depression, and hostility. Any of these syndromes may be reflected in characteristic faulty learning styles.

With regards to their cause, Stott (1978) suggests that "to a greater or lesser degree, they are brought on by adverse experiences. In the case of hostility, it is probably the result of the child's lack of faith in the continuance of his parents protection and love. Depression may be the result of lack of sleep, exposure to a highly disorganized home environment or chronic illness" (p. 29).

Stott contends that the "originating causes" of learning failure are the four behaviour disturbances mentioned above. According to this interpretation, it is the learning problem itself rather than the disturbed behaviour, which is the major area of emphasis. They are termed "originating causes in the sense that they are antecedent to and calculated to produce faulty learning attitudes" (p. 29). These disturbances, in turn, may be constitutionally (i.e. physiological maldevelopment) or environmentally (i.e. frequent changes in schools, without parental support) induced.

Cruikshank (1975) contends that:

Emotionally disturbed or socially maladjusted children are those, who because of breakdown in the family constellation, a developmental disturbance, or an economic, social, religious or ethnic conflict, fail to mature socially and emotionally within the limits which their society imposes (p. 6).

Furthermore, such a child may be "responding out of a pattern of inadequate socialization (value incorporation defects and alienation) or inner stress and conflicts (reflecting flooded emotional states such as anger, fear, unworthiness, low self-esteem, defeat, and depression)" (p. 556).

The SEECC Report (The Canadian Committee, 1971) makes reference to causative factors implicit within its definition of the behaviourally or socially disordered child as one who exhibits behaviours such as:

Inconsistent response to life situations and frequent significant difficulty in school achievement, in social relationships, in sense of self esteem which may result from experience and or biological limitation.

Problems of adjustment and communications in the school system related to ethnic and cultural difference (p. 45).

The latter definition is qualified in the statement that "it does not mean that cultural differences are in themselves undesirable, but where these create a problem for a child's integration into the school system . . . schools must be prepared to offer some form of remediation" (p. 45).

One of the most comprehensive reviews of causal factors contributing to behavioural disorders has been provided by Kirk (1972), who classifies causes into three main groups: psychological, psychosocial, and possible organic factors.

Kirk explains that underlying theories of psychological causes of BE is the assumption that frustration is the single most influential factor in the development of disorders. Depending on the nature of the frustrating experience(s) confronting an individual, three alternative reactions can be expected – aggression, regression, and/or resignation.

When goal-directed behaviour meets with interference, the individual is frustrated, and this frustration leads to a response in aggressive behaviours – striking, fighting, abusive language and anger. Regression to earlier forms of behaviour results from the denial of a desirable object or activity which the individual has had an opportunity to experiment with, and which is furthermore displayed as a constant reminder of its loss. Resignation refers to the loss of motivation and inability to respond constructively following repeated frustration.

Again, Kirk employs the concept of discrepancy between behavioural capacity and environmental requirements to explain situations in which one is faced with an excessively difficult task, or is confronted with two impossible courses of actions and is forced to follow one. Such situations result in deviations of aggression, regression, compulsive behaviour, fixations, and other bizarre responses.

Within the school setting, when a slow learner, learning disabled, or educationally retarded child is consistently pressured to attempt tasks which guarantee his failure, his response may be aggression or hostility, or he may choose to escape the situation in truancy.

Psychosocial factors capable of causing behavioural disorders may be related to: 1) early home experiences, and 2) the social and economic aspects of the child's environment.

In discussing early childhood experiences, Kirk points out that the child-rearing methods characteristic in homes of children with conduct disorders featured inconsistent discipline and parental rejection or hostility. Moreover, there is little expressed affection between family members. In the homes of delinquents, certain constellations of factors seem to be more significant than are single factors, such as quarrelsome home plus lax discipline, or a neglecting mother who provided a deviant role model and whose discipline was erratic and punitive.

The social and economic factors which influence development are largely determined from the economic status of the family, the values transmitted in the home, and the socio-cultural values derived from the school and community. Kirk suggests that a combination of factors – such as poverty, affiliation with delinquent subculture, pressure to be "tough", failure of the school to respond to community needs, etc. – from a child's home, school, and community underlie the development of behavioural disorders.

Physiological factors are also capable of causing behaviour deviations. According to Kirk, many behaviour problems, both emotional disturbance and conduct disorder, are the result of physiological dysfunctions such as glandular disturbances, biochemical imbalance, chronic fatigue, or poor nutrition.

C. Incidence

As with all types of exceptionality, the prevalence rates of BE reported in the literature are variable, depending on the criterion of behaviour disorders used by the investigator.

Rutter and Graham (1970) screened 2,200 children of 9 to 11 years, and found that 5.7% had some "clinically significant" psychiatric disorder. The Ontario Ministry of Education (1971) reports that a total of 4% of school children are either emotionally disturbed (1%), or socially maladjusted (3%). The US office of Education (1974) and le Ministère de l'Éducation du Québec (1972) are more conservative in their estimates: 2%, and 2.25% respectively.

Given this range of opinion, it is reasonable to assume that some 4 to 5% of children have behavioural problems which are recognizable within the school setting, but that only 2% are unable to function without modifications to the regular program.

D. Identification and Assessment

The child with a behavioural deviation of a degree which warrants special educational consideration is usually recognizable in the early grades.

Severe cases, at least, are likely to manifest identifying characteristics during early childhood, especially if the child presents a discipline problem. However, teachers must also be aware of the significance of behaviours which are not disruptive to the class, such as depression, or excessive anxiety, or of sudden changes in a child's personality.

The Ontario Ministry of Education (1971), has outlined a comprehensive list of identifying characteristics of behavioural disturbance:

- A. Inability to learn at a rate commensurate with intellectual, sensory, motor, and physical development.
- B. Inability to establish and maintain adequate social relationships.
- C. Inappropriate response to day-to-day life situations.
- D. A variety of excessive behaviour ranging from hyperactive, impulsive responses to depression and withdrawal.
- E. Physical symptoms:
 - 1. frequent physical problems
 - 2. proneness to accidents
 - 3. anxiety about own health
 - 4. malingering
 - 5. excuses for own inner tensions through some physical difficulty
- F. Regression-going back to earlier forms of behaviour.
- G. Aggression-hostility towards teachers, playmates, or parents; taking things into own hands.
- H. Withdrawal into fantasy:
 - 1. daydreams
 - 2. unsatisfactory relationships with peer group or teachers
 - 3. and isolationist in the classroom
- I. Fear of failure and criticism, at times a perfectionist.
- J. Development of phobias or compulsions (p. 41).

Children who consistently manifest any of these symptoms, and who clearly indicate an inability to learn in the regular classroom are then referred for further assessment. Invariably, the nature of the problem will require that a psychologist and/or psychiatrist participate in assessment.

In the area of BE, a major consideration in assessment is in distinguishing between problems which are due primarily to psychological factors, and problems which have developed secondary to other handicapping conditions. As previously stated, this distinction is of particular importance for learning disabled children, who frequently develop serious emotional problems if the disability itself is unrecognized.

Freedman et al (1972) recommend that the evaluation process for BE should consist of the following components: family history, developmental history, psychiatric examination, neurological assessment, and psychological testing - including intelligence, aptitude, readiness, achievement, and personality tests.

Regardless of the method employed, the goal of evaluation is to determine the nature of the child's problem; its cause, its severity, its correlates and the way in which it has affected learning ability. Essentially, the final report of evaluation must include all information relevant to the provision of an appropriate educational program.

E. Educational Needs

Children with behavioural disorders vary widely in terms of educational needs, depending on the type and severity of the problem. For this reason, a wide range of special services must be provided for children within this category of exceptionality.

Children who are found to have minor problems usually remain in the regular classroom. In such cases, the purpose of evaluation is to provide the regular classroom teacher with greater insight into the child's problem, and to indicate the best approach to be followed.

Other mild problems may require that the teacher obtain additional consultative help from special educational personnel to gain a better understanding of the child, and suggestions for treatment. The major responsibility for the child's care nonetheless remains with the classroom teacher (Kirk, 1972).

Moderate cases may require counselling sessions on a regular basis, part-time resource room attendance, or part-time enrollment in a special class.

For students who have severe behaviour disorders, the services of a full-time special class, a special day school, residential school, psychiatric hospital, or mental health clinic may be required.

In determining the program needs of the child who is unmanageable within the school setting, the decision as to whether a special day school or residential center is recommendable depends entirely on elements within the home. As Freedman et al (1972) explains:

Residential treatment is used if a child's symptoms indicate serious pathology that is supported, maintained, aggravated, and possibly caused by the environment within which he lives. It is used if the child is . . . amenable to a treatment program offering 1) separation from his environment 2) a corrective emotional experience through daily care 3) an opportunity to make use of individual psychotherapy 4) an opportunity for the parents to make use of psychological help (p. 659).

Otherwise, "Helping a child within the home and community has the advantage of permitting simultaneous change in child and parents so that readaptation is facilitated" (p. 660).

Clearly, programs for children with behavioural disorders place considerably greater emphasis on psycho-social development than do regular programs. Moreover, there is a greater need for educators to involve themselves with the student's family, since it is within the home that the factors which have precipitated and which maintain the problem are frequently found.

In addition, there is considerably greater overlap in the responsibility of health professionals and educators in the area of BE. Traditionally, the major responsibility for treatment has been placed largely with the medical-psychiatric profession. In recent years, however, the trend towards mainstreaming (vs. residential care) and the increase in supportive services for mild and moderate cases in the school setting has shifted the balance of responsibility. As Kirk, (1972) explains:

. . . there has been a shift in emphasis and responsibility from 1) the medical profession being the responsible agent for treatment, using teachers as ancillary personnel, to 2) the schools becoming the responsible agents for treatment, with the ancillary assistance of psychiatrists, psychologists, social workers, and others as conjunctive personnel (p. 402).

Despite this shift, both professions must be involved in the treatment of the BE child and must recognize the importance of interdisciplinary communication.

The extent to which the regular classroom must be modified for the BE student depends on the child's intellectual level and the extent to which the basic disorder has disrupted the normal learning process.

The major contention is that normal learning will follow from the resolution of underlying psycho-social problems. Numerous strategies have been developed for this purpose; i.e. the psychodynamic, behaviour modification, psycho educational etc. . . (Kirk, 1972). Some of

these focus on the symptoms of the disorder, based on the assumption that the problem can be resolved through changing or improving behaviour patterns. Others seek to eliminate causal conditions, such as in the child's environment, or within the dynamics of the child's own personality.

Regardless of approach, the fundamental objective is a healthy reorganization of the personality and an improved emotional adjustment. Moreover, certain objectives are common to all educational approaches represented in the literature: the importance of a good teacher-child relationship, of increasing the child's self-esteem, of improving social skills and encouraging a mature approach to responsibility.

Psychopharmacotherapy is also widely used in the treatment of behaviour disorders. Among drugs commonly prescribed to the behaviourally disordered child are tranquilizers, stimulants, antidepressants, and barbiturates, depending on the nature of the disorder. The limitation of this approach, however, is that although chemicals can modify a child's responsiveness to his experiences, they cannot conceivably undo learned behaviour, character patterns, or neurotic attitudes.

Generally, the unique characteristics of the child who is behaviourally disordered will determine the type of educational program best suited to his needs.

II. COMMUNICATION EXCEPTIONALITIES

Introduction

According to the Ontario Ministry of Education (1976), "Traditional classifications in this area are:

- a) Hearing impairment
- b) Learning disabilities (perceptual handicaps, neurological impairment, etc. . .)
- c) Speech and language disorders" (p. 7)

In this delineation, children are grouped on the basis of their learning characteristics. The characteristic common to each of the above types of exceptionalities is a disruption of either the receptive or expressive functions essential to communication.

In doing so, this approach departs somewhat from other classification systems emphasized in the literature. More than any other types of exceptionality, learning disabilities, hearing impairment, and speech and language disorders are subject to variation in classification.

Reynolds and Birch (1977), for example, divide exceptional children into seven groups, in which these are included as major and distinct categories.

The state of Michigan (1973) departs further from the Ministry's approach to communication, in its inclusion of the hearing impaired within "physical handicaps", and grouping speech defective, perceptually handicapped, and learning disabled within the major category of "other conditions".

The Carleton Board of Education (1973) places speech and hearing impairment within "physical handicaps", and sub-categorizes language disorders under "learning disabilities".

According to the view expressed in the SEEC Report (The Canadian Committee, 1971), disruption in communication is the underlying factor which differentiates all exceptionalities, and is not in itself a separate area of exceptionality:

... communication, or with the handicapped, impaired communication is ubiquitous in its relevance and significance. In children with sensory impairments, and those with speech disorders, communication is a relevant factor. Increasingly, communication disruption is being recognized as a common element of learning disability, emotional disturbance, and mental handicap. Communication disruption, therefore, represents a common thread which runs through all categories of exceptionality. (p. 14).

Within this framework, hearing impairment ("organic and psychogenic hearing deficit; communication disorders related to hearing loss") and language disorders (language impairment related to inability to acquire skills through the usual auditory channels) are defined as "sensory disorders". Moreover, "speech disorders" are defined as an area of exceptionality ("deviations which draw attention to the manner of speech or interfere with the ability to comprehend or formulate speech and to express their intentions effectively") separate from language problems; and learning disabilities ("inability to learn in the usual or normal manner despite emotional, motor, sensory, and intellectual integrity") are placed within the same category of "primary learning disorders" as "sub-average intellectual functioning" (p. 15).

Such a wide disparity of opinion concerning the classification of communication disorder accurately reflects the major problems of current concern in the field of special education. A review of the literature reveals that there are numerous issues in this domain which remain unresolved; i.e. the question of whether a child handicapped by an inability to express himself verbally have similar educational needs.

In the same vein, educators are divided on such questions as whether a non-verbal, deaf child and a non-verbal child who hears normally should be classified within the same category because both require a language development program, or whether they should be separated because of differing etiologies. Presently, the general trend is to classify hearing impairment as

a "sensory disorder", distinct from learning disabilities, or speech and language disorders. Kirk (1972), for example, does delineate the category of "communication disorders", which includes a) learning disabilities and b) speech handicaps, but views "a) auditory handicaps and b) visual handicaps" to comprise exceptionalities of "sensory handicaps".

Despite such inconsistencies in classification, the category of communication disorders, as represented in this review, is given much support in the literature. For example, the definition of "communication disorders" provided by the Council for Exceptional Children (1977) may be used to justify the categorization of hearing impairment, learning disabilities and speech and language disorders within this group:

Individuals with communication disorders are those who exhibit an impairment in speech and/or language (including impaired articulation, stuttering, voice impairment, and a receptive or expressive verbal language handicap) that is sufficiently severe to adversely affect the performance of an individual in the usual school program (POP, p. 2).

Similarly, Gallagher (1975) suggests that:

The field of communicational disorders is concerned with disturbances of language and development behaviour which result from sensory deprivation, central nervous system dysfunction, mental retardation and various other conditions. It includes professionals from many disciplines such as speech and language pathology, audiology, learning disabilities and education of the hearing impaired. The emphasis of research and practice relates to the perception, comprehension and use of auditory language, teaching written language and other symbol systems. Although there is overlap among fields, the central focus is on those variables which facilitate or impede communication (p. 362).

Accordingly, the sub-categories of communication disorders to be presented in this review of the literature include:

1. Hearing Impairment
2. Learning Disabilities
3. Speech and Language Disorders

1. HEARING IMPAIRMENT

A. Definition and Classification

According to the Ontario Ministry of Education (1971), "hearing handicapped children" refers to students who:

- i) are hard of hearing and have a hearing loss of a degree that holds back the development of clear speech and language, but which is not so severe as to prevent the development of speech and language, with or without sound amplification; and/or
- ii) are deaf and have a hearing loss in the better ear to such a degree that they cannot understand and acquire speech and language through the sense of hearing, even with sound amplification.

Although actual definitions vary to some extent, the classification of hearing impairment into the groups of deaf, and hard of hearing has been unanimously accepted. Le Conseil Canadien de Coordination de la Déficience Auditive (C.C.C.D.A., undated) has adopted the terms "surdité profonde (totale)" and "durs d'oreille" to refer to these same two types.

This distinction, which is based upon degree of hearing loss, is of the greatest importance due to the developmental differences between persons who have had to rely totally on avenues of learning other than the auditory channel, and persons who have impaired auditory ability which can be improved through hearing amplification. Degree of hearing loss is thus the single most important factor in the classification of auditory disorders.

For educational purposes, however, the literature suggests that certain other variables warrant consideration in classifying hearing exceptionalities. The second variable which should serve as a basis for educational grouping, reports Kirk (1972), is age of onset. Inevitably, a child who became deaf subsequent to the development of language and speech will react quite differently to learning and communication than a child who has never learned to speak or communicate verbally. As Kirk explains: "This is particularly important from an education point of view because if an individual has already acquired speech before the loss of hearing, the whole communication and educational process is different from that used with persons who have never known speech or language" (p. 240).

The variable of "age at onset" has been recognized by the conference of Executives of American Schools for the Deaf, (1975) who recently joined with the convention of American Instructors of the Deaf to publish a statement on definition, in which "deafness" is sub-categorized as follows:

Prelingual deafness: deafness present at birth, or occurring early in life at an age prior to the development of speech or language.

Postlingual deafness: deafness occurring at an age following the development of speech and language (p. 510).

The third variable which may influence the educational needs of the hearing impaired is type of hearing loss. Kirk suggests that because of the complicated structure and functioning of the ear, defects in hearing may occur in many different forms. Basically, these defects are of two types: 1) conductive loss, is one which reduces the intensity of sound reaching the inner ear, where the auditory nerve begins. "Any condition hindering the sequence of vibrations or preventing them from reaching the auditory nerve may cause a conduction loss" (p. 250) and 2) sensory-neural or perceptive loss: "caused by defects in the sensory nerve of the inner ear or of the auditory nerve transmitting the impulse to the brain" (p. 252). According to Kirk, "The proper diagnosis of a hearing defect is a very important and very technical matter. The treatment, the educational program, and even the selection of a hearing aid are dependent upon it" (p. 253). A child with sensory-neural defect, for example, would gain no benefit from a bone-conduction hearing aid.

Thus, the variables to be considered in classifying hearing impairments are: 1) degree of hearing loss (deaf and hard of hearing) 2) are at onset (prelingual and postlingual deafness) and 3) type of hearing loss (conductive, or sensory-neural). Of these, degree of hearing loss is the most important, for educational purposes, due to the fact that hard of hearing children are educated through the auditory channel, while deaf children are educated primarily through sense modalities other than the ear (Kirk, 1972).

Further to the deaf/hard of hearing delineation of auditory disorders, learning loss may be operationally defined according to international standards, such as the current ISO (International Standard Organization; Davis and Krantz, 1964) standard. In this manner, deficits are measured in decibel units by means of an audio-meter. Rapport COPEX (Ministère Education Québec, 1977) offers the following audiometric classification:

Surdit -personne qui sur la foi d'un examen appropri  a une perte auditive se situant   80 d cibels et plus   l' coute de meilleure oreille.

Demi-surdit -personne qui sur la foi d'un examen appropri    une perte auditive se situant entre 25 et 80 d cibels   l' coute de la meilleure oreille (p. 111).

Reynolds and Birch (1977) are of a different opinion. "A widely used cut off point indicates that deaf children have hearing losses greater than 90 decibels in the better ear and that hard of hearing persons have hearing losses not that great" (p. 532)

Reynolds and Birch (1977) further classify hearing loss into six categories, in which six degrees of handicap are defined in terms of decibel loss - insignificant (0-25), a slight (26-40), mild (41-55), marked (56-70), severe (71-90), extreme (91 +).

B. Causes

From a review of the literature, it appears that two principal methods are used to classify the causes of hearing defects.

Following the first method, many investigators have chosen to break down causes into two groups: those which are related to hereditary factors, and those which are related to all other externally produced factors. CCCDA (undated) uses the terms "surdit  hér ditaire" and "surdit  cong nitale" to distinguish between these two groups of causes. Hewitt (1977) proposes the following distinction: "Endogenous deafness is the result of an inherited defect; exogenous deafness is caused by disease or injury" (p. 154).

Inherited deafness is self-explanatory; it is an auditory disorder which is attributed to confirmed cases of hearing defects in previous generations. According to Davis and Fowler (1960), "... if both parents have true hereditary deafness, their children will almost certainly be born deaf or soon become deaf" (p. 110). Mindel and Vernon (1971) found that hereditary factors were responsible for 5.4 percent of cases when the criterion used was that of both parents being deaf, and that this increased to 26.4 percent using the criterion of "any family member".

Otosclerosis is one hereditary disease which is known to be capable of affecting hearing at any stage of life. Degeneration of the auditory nerve is another condition which appears to be hereditary (Kirk, 1972).

The second category includes a wider range of factors, which are more specifically described. CCPA (undated) suggests that "surdit  cong nitale" may be caused by any of the following:

... maladie infectueuse maternelle durant la grossesse, telle que la rub ole ou les effets toxiques de certaines drogues sur l'embryon.

... un accouchement pr matur , l'anoxie (diminution de l'apport vital d'oxyg ne) ou toute l sion c r brale subie par le b b , peuvent  galement entra ner une perte d'audition.

... les deux principales causes   la source d'hypoacousie,   un  ge plus avanc  sont le bruit et le vieillissement. Les maladies infantiles comme la scarlatine, la m ningite et la rougeole peuvent conduire   une hypoacousie, mais plus rarement qu'autrefois. Parmi les autres origines de la surdit , on peut citer les infections s v res de l'oreille, les chocs traumatiques et les effets nocifs de certains stup fiants, pris   dose massive (p. 4).

Another more prevalent approach to the classification of causes is to delineate etiological factors into three major groups: those which arise prior to birth, those which arise during delivery, and those which occur subsequent to birth. Bussi res et Brazeau (1975) have outlined a table of "Des Causes de la Surdit " (p. 20), in which the following three categories are presented:

1. Pr natales:
 - h r dit 
 - g n tique
 - rub ole
 - thalidomide
2. P rinatales:
 - difficult s   la naissance
 - pr maturit  et postmaturit 
 - maladie h molytiques
 - RH/Kernict re
3. Postnatales:
 - m ningite
 - rougeole, oreillons, fi vres
 - streptomycine

Similarly, Kirk (1972) divided the causes of hearing defects into three time periods: causes occurring before birth, traumatic and other conditions at birth, and causes occurring after birth.

Before birth, Kirk explains, prenatal infections and toxic conditions of the mother may create auditory defects in the child. These include the viruses of mumps and influenza, rubella, and diseases such as otosclerosis.

At the time of birth, damage to the central nervous system resulting in audiological defects may arise from the use of forceps, intracranial hemorrhage, lack of oxygen caused by prolonged labour, heavy sedation or blockage of the infant's respiratory passages, or blood incompatibility between the mother and infant.

Postnatal diseases and accidents account for a large percentage of hearing losses occurring after birth. Infectious diseases such as scarlet fever, mumps, diphtheria, whooping cough, measles, typhoid fever, pneumonia, and influenza have been known to impair hearing ability. Other factors occurring after birth include otitis media (an infection of the middle ear), meningitis, concussions, intracranial tumours, and the toxic effect of certain drugs. The most common postnatal cause of hearing defect is known as presbycusis, a deterioration in hearing related to old age.

Finally, auditory defects may be of psychological or emotional origin. Hysterical deafness is one example of psychogenic hearing loss.

Despite recent advances in audiological research, which has sought to identify specific etiological factors underlying hearing impairment, the great majority of hearing losses are of "unknown" etiology. According to the "Plan Quinquennal" (Ministère des Affaires Sociales Québec, 1977), "30 à 40% de la surdité demeure d'étiologie inconnue" (p. 5).

C. Incidence

The SECC Report (The Canadian Committee, 1971), which provides incidence tables of exceptionalities for each of the Canadian provinces, indicates that .575% of school children are either deaf or hard of hearing. This estimate, which is consistent for all ten provinces, is based upon enrollment in elementary and secondary schools, and thus represents only that proportion of cases which are identified and placed in a special program.

In contrast, the CCCDA (undated) claims that 10% of the population is deaf or hard of hearing. It is reasonable to assume that this figure includes impairments at all levels of severity.

Le Plan Quinquennal (Ministère des Affaires Sociales, 1977) more recently reports that the incidence of hard of hearing (entre 25 et 80 décibels) is .5% and deafness (80 décibels et plus), is .1%.

This is consistent with the "Population Estimates" of the US Bureau of Education (in Taylor and Jackson, 1976), which reports the total incidence of deaf and hard of hearing children to be .6% (.1% deaf, .5% hard of hearing).

D. Identification and Assessment

As with all areas of exceptionality the early identification of hearing impairments is essential, to minimize the detrimental effect of the handicap, and to maximize the impact of special education.

Le Plan Quinquennal (Ministère Des Affaires Sociales Québec, 1977) outlines the following reasons to stress the importance of early identification:

- assurer que l'acuité auditive résiduelle reçoive une stimulation maximum durant toute la période cruciale de développement, c'est-à-dire entre 0 et 5 ans;
- le manque de soins concrets en bas âge (0-5 ans) ralentit le développement ultérieur de la perception et du langage;
- minimiser les troubles émotifs et psychologiques qui sont susceptibles de se développer à la suite de difficultés de communication;

- minimiser l'anxiété des parents en leur offrant une aide personnelle concernant la condition de leur enfant, le plus tôt possible (p. 10).

While children who are profoundly deaf, or extremely hard of hearing are easily recognized, those who are moderately impaired may escape the attention of parents or special education personnel.

As Kirk (1972) explains,

Often a child with a hearing loss of 40 or 50 decibels is not detected by parents or teachers since he hears conversational speech and probably learned to talk at an average age. Sometimes deviant behaviour is not recognized as related to hearing loss but is attributed to other factors (such as low intelligence, emotional problems, lack of interest) which may not be pertinent (p. 258).

An awareness of the behavioural and developmental characteristics of the hearing handicapped child is thus an essential ingredient to the provision of adequate care.

According to the literature, an infant of less than three months of age is unlikely to exhibit any clearly identifiable characteristics of hearing impairment. Thus, until the child is three months old, a diagnosis of deafness or hearing loss is only given consideration in terms of the potential influence of hereditary factors. Beginning at three months, however, a normally hearing child is known to follow a specific pattern of response to auditory stimuli, and any departure from this pattern may be indicative of hearing loss. The CCCDA (undated) suggests that a child should be tested for the following reactions, and that any evidence that the child's behaviour does not correspond to these norms warrants immediate attention.

- de la naissance à trois (3) mois: sursaute à un claquement des mains (à une distance de 3 à 6 pouces)

- de 3 à 6 mois: s'arrête de bouger ou de pleurer lorsqu'on l'appelle, ou s'il entend un bruit inhabituel

- de 9 à 12 mois: se tourne vers la personne qui l'interpelle, située à une certaine distance de lui et hors de sa vue

- à 2 ans: s'exprime par des courtes phrases (p. 5)

The Ontario Ministry of Education (1971) offers the following table of behavioural systems, which may be used as a guideline for pre-school children:

A. Mild or moderate hearing losses:

1. ignores, confuses, or does not comply with directions,
2. daydreams overly,
3. educationally retarded,
4. slight speech defect,
5. "lazy",
6. "dull".

B. Signs suggestive of deafness in infants and young children:

1. Hearing and comprehension of speech
 - a) general indifference to sound
 - b) lack of response to spoken word
 - c) response to noises as opposed to words
2. Vocalization and sound production:
 - a) monotonal quality
 - b) indistinct
 - c) lessened laughter
 - d) meagre experimental sound plan and squealing
 - e) vocal play for vibratory sensation

- f) head banging, footstamping for vibratory sensation
 - g) yelling, screeching to express pleasure, annoyance or need.
3. Visual attention and reciprocal comprehension:
 - a) augmental visual vigilance, attentiveness
 - b) alertness to gesture and movement
 - c) marked inattentiveness to play
 - d) vehemence of gesture
 4. Social rapport and adaptations:
 - a) abnormal rapport in vocal nursery games
 - b) intensified preoccupation with things rather than persons
 - c) inquiring, sometimes confused or thwarted facial expressions
 - d) puzzled and unhappy episodes in social situations
 - e) suspicious alertness, alternating with cooperation
 - f) markedly reactive to praise and affection
 5. Emotional behaviour:
 - a) tantrums to call attention to self or need
 - b) tensions, tantrums, resistances due to lack of comprehension
 - c) frequent obstinancies, teasing tendencies
 - d) irritability at not making self understood
 - e) explosions due to self-vexation
 - f) impulsive and avalanche initiative (p. 38-39).

Parents who understand the significance of such behaviours may then take immediate measures to ensure that an appropriate developmental program is initiated before the child is of school age. However, as previously suggested, the probability of early identification increases with the severity of the hearing loss. For this reason, children of mild to moderate impairment are frequently denied adequate care during the elementary school years. And as MacTavish (1976) points out, "Even minor degrees of hearing loss have a detrimental effect on a child's school performance and his behaviour" (p. 18).

Thus, it is the responsibility of the school to ensure that children who begin school undiagnosed are identified as early in their educational career as possible. While the school cannot be held responsible for the failure of parents to recognize the symptoms of hearing impairment during the preschool years, it must ensure that its teachers do not repeat the same mistake. Classroom teachers must therefore be trained to recognize the behavioural and developmental characteristics associated with hearing impairment.

Reynolds and Birch (1977) suggest that there are five principal symptoms of hearing problems which teachers must recognize as indicating a need for audiological attention:

1. The child appears to strain to hear, including leaning toward the speaker and cupping the ears with the hands
2. The child asks to have comments and questions repeated and then gives the correct answers
3. The child shows speech inaccuracies, especially dropping the beginnings and endings of words
4. The child is frequently confused during discussions, even though evidently trying to participate
5. The child has running ears, soreness, or aches and frequently rubs and scratches the outer ear canal (p. 518).

Inevitably, the prominence of these characteristics depends on the degree of hearing loss, the extent to which the child is able to understand speech. Tables I and II serve to illustrate the effect of various levels of hearing loss on a child's comprehension of speech and language.

Effects and Prevalence Data For
Decibel Levels and Degrees of Hearing Loss

Decibel Loss In Speech Range	Degree of Handicap	Ability to Understand Speech	Prevalence In Percent
0-25	Insignificant	No difficulty	98.25
26-40	Slight	Problems with whispers or soft speech	1.0
41-55	Mild	Consistent problems with normally loud speech	0.5
56-70	Marked	Loud speech often not understood	0.2
71-90	Severe	Understands only strongly magnified speech	0.05
91-	Extreme	Maximally amplified speech not understood	

Table 1

Reynolds & Birch, 1977; p. 520

Table II

Relationship of Degree of Impairment to Educational Needs

Average of the speech frequencies in better ear	Effect of hearing loss on the understanding of language and speech	Educational needs and programs
Slight 27 to 40 db (ISO)	May have difficulty hearing faint or distant speech. May experience some difficulty with the language arts subjects.	Child should be reported to school principal. May benefit from a hearing aid as loss approaches 40 db (ISO). May need attention to vocabulary development. Needs favorable seating and lighting. May need lipreading instructions. May need speech therapy.
Mild 41 to 55 db (ISO)	Understands conversational speech at a distance of 3-5 feet (face to face). May miss as much as 50% of class discussions if voices are faint or not in line of vision. May exhibit limited vocabulary and speech anomalies.	Child should be referred to special education for education follow-up. Individual hearing aid by evaluation and training in its use. Favorable seating and possible special class placement, especially for primary children. Attention to vocabulary and reading. Lipreading instruction. Speech conversation and correction, if indicated.
Marked 56 to 70 db (ISO)	Conversation must be loud to be understood. Will have increased difficulty in group discussions. Is likely to have defective speech. Is likely to be deficient in language usage and comprehension. Will have limited vocabulary.	Child should be referred to special education for educational follow-up. Resource teacher or special class. Special help in language skills: vocabulary development, usage, reading, writing, grammar, etc... Individual hearing aid by evaluation and auditory training. Lipreading instruction. Speech conversation and correction. Attention to auditory and visual situations at all times.
Severe 91 db or more (ISO)	May hear some loud sounds but is aware of vibrations more than tonal pattern. Relies on vision rather than hearing as primary avenue for communication. Speech and language defective and likely to deteriorate.	Child should be referred to special education for educational follow-up. Full-time in special program for deaf children, with emphasis on all language skills, concept development, lipreading and speech. Program needs specialized supervision and comprehensive supporting services. Continuous appraisal of needs in regard to oral and manual communication. Auditory training with group and individual aids. Part-time in regular classes only for carefully selected children.

Kirk, 1972; p. 244-245

In seeking to improve the accuracy of identification measures in the school, a knowledge of these characteristics is particularly important for teachers of the early grades. This knowledge alone would greatly reduce the likelihood of cases of hearing impairment escaping specialized attention. A proficiency in the use of informal testing techniques which can be administered in the classroom would further reduce that likelihood. Kirk (1972) mentions 3 such informal tests: conversation at 20 feet, whisper tests, and watch-trick tests (p. 246).

In seeking to establish a high quality educational program for children with auditory disorders, school systems must go beyond the level of teacher training. As the Ministère des Affaires Sociales Québec, (1977) points out,

Une politique globale de réadaptation des enfants avec handicap auditif doit s'établir autour des pôles suivants:

- prevention des troubles auditifs
- dépistage précoce
- programme de réadaptation en bas âge
- appareillage précoce et adéquat
- scolarisation en milieu ouvert
- formation du personnel (p. 5)

Similarly, Kirk (1972) suggests that such a program involves 3 stages:

In fulfilling its responsibilities to hard-of-hearing children, the school has to 1) identify those needing help, 2) see that they are adequately diagnosed and given whatever medical treatment is necessary, 3) provide an appropriate educational program (p. 258).

In this respect, any systematic attempt to educate the auditorially handicapped must involve screening procedures, which are first implemented when a child begins school and repeated periodically in the higher grades. Kirk suggests that such a screening program may consist of either individual or group testing, administered by the school nurse, and audiologist, or a hearing specialist.

The steps in identification diagnosis may be summarized as follows:

1. Preliminary screening of children
2. Threshold testing, and if hearing handicap is found, referral for otological examination
3. Otological examination and medical treatment if indicated
4. Audiological examination to include special tests and hearing-aid evaluation
5. Psychoeducational evaluation and special educational services (Kirk, 1972, p. 259).

The Ministère des Affaires Sociales du Québec (1977) recommends that a comprehensive screening program should begin at age 2 months, and specifies the type of test which should be administered at 5 different age levels: 0-2 mois: évaluation audiolgique; 6 mois: test d'orientation, questionnaire; 3 ans: test tonal à intensité fixe; 5 ans: test tonal à intensité fixe, tympano-impédancemétrie; 6-12 ans: idem, examen médical (taken from Tableau 2: Synthèse des Moyens de Dépistage Auditif, p. 33).

E. Educational Needs

The most important consideration in the education of the deaf and hard of hearing is that the educational needs of each differ distinctly. The major emphasis in the education of the deaf is the development of language and communication competencies which fail to develop in the absence of the primary sensory modality through which they are acquired. As Kirk (1972) states, "Without hearing he does not naturally acquire speech and language, without speech and language, he does not acquire knowledge of other subject matters" (p. 274). Their major deficiency is not that they are unable to hear, but their inability to hear prevents them from

developing the usual means of communication. Thus, the goal of deaf education is to develop alternative means of communication through other sense modalities, and through deriving maximum benefit from any residual hearing.

For the hard of hearing child, the goal of education is to train and amplify the limited hearing ability of the child in order to allow the auditory channel to serve as the modality through which communication may develop.

Several investigators have outlined the characteristics of the hearing impaired child which determine his educational needs, and which must serve as a basis for the development of a specialized program.

The first factor which influences the child's development is the degree of hearing loss (Kirk, 1972). Further to the fact that different methods are employed to teach the deaf and the hard of hearing, the more serious the hearing impairment, the greater the degree of developmental retardation, and the more serious the special education problem (Reynolds and Birch, 1977). Severely hard of hearing children, for example, can be expected to be less proficient verbally than moderately hard of hearing children. Moreover, they will require a more intensive auditory training program, and more powerful technical assistance than the lesser impaired.

The second factor which influences a child's educational needs is age of onset (Kirk, 1972). Invariably, the age at which an auditory disorder occurs, and the corresponding stage to which speech and language has developed, will dictate the extent and type of specialized training required. Generally, the earlier in childhood the hearing impairment occurs, the more seriously it will impede development (Reynolds and Birch, 1977).

The third factor of educational importance is the nature of the hearing defect (Kirk, 1972; Reynolds and Birch, 1977). The program required for an auditorily impaired child varies according to whether the problem is related to a bone-conduction loss, or a sensory neural loss. Furthermore, hearing problems differ in terms of their level on the two dimensions of sound-frequency and intensity. Intensity refers to the relative loudness of sound, and actually defines the degree of impairment, as previously discussed. Frequency, however, refers to the pitch of the sound, such that hearing losses vary in terms of the frequency of sounds which a child has difficulty detecting. An individual may have no difficulty hearing sounds at certain frequencies whereas those of other frequencies are inaudible to him (Kirk, 1972). The most serious kind of frequency deafness is that within the range of the human voice in normal conversation (Reynolds and Birch, 1977).

The fourth factor which will influence educational programming is the cognitive development of the child. Both Reynolds and Birch (1977) and Kirk (1972) seem to suggest that children possess different levels of intelligence, and that this variance necessitates an awareness of the intellectual potential of the hearing impaired child in determining programming needs. Generally, children of superior intelligence will require a more accelerated program, one which more closely approximates that of the regular class.

The fifth factor of significance is the nature and amount of stimulation which has been provided to the child (Reynolds & Birch, 1977). In examining the home environment of the child, areas requiring greater attention, and elements of development which the specialized program must stress may be identified.

In meeting the needs of both deaf and hard of hearing children, Caccamise (1974) contends that there are six key concepts concerning hearing impaired children which must be understood by all who participate in their education. Briefly, the hearing impaired child is 1) an intellectual equal of his peers, 2) can lead as richly meaningful and socially fulfilling life as others, 3) can achieve at a level commensurate to his age level and 4) develops the same amount and kind of personality problems. The fifth characteristic is that there are three kinds of learning problems unique to the hearing handicapped: 1) an understanding of language as a means of communication and as a basis for further learning is extremely difficult to attain 2) effective communication with other persons presents numerous problems 3) learning to substitute other senses to compensate in situations which are wholly dependent on an ability

to hear. Finally, the sixth characteristic Caccamise proposes is that none of these three problems are insurmountable.

Moore (1970) further suggests that educators of the hearing impaired should focus on five major areas:

1. Optimal period-Importance of first 3 to 4 years of life to language acquisition.
2. Teaching and learning-Importance of the teacher's role as that of learning facilitator.
3. Language and speech-Importance of making a clear distinction between speech and language.
4. Performance and competency-Importance of attacking the problem of inappropriate utterances at the deep structure level.
5. Imitation and expansion-importance of good mother-child communication (p. 42).

Project NEED (Bitter, 1974), Noher (1973) and Paul (1972) are among many who have developed complete inservice packages which highlight the major issues of importance in teaching the hearing impaired, and which provide guidelines for the organization and management of specialized programs.

In more specific terms of instructional strategies, the major emphasis in teaching the hard of hearing, as previously stated, is to optimize auditory function; for the deaf, it is to compensate through alternative sense modalities. A review of the literature, however, reveals that certain elements of teaching approaches are common to both: emphasis on the presentation of material which appeals to the visual mode; the importance of using instruments to amplify even the most minimal residual hearing ability, and the overwhelming importance placed on the development of speech and language.

Kirk (1972) contends that the instruction of the hard of hearing consists of four major components: instruction in the use of hearing-aids, auditory training, speech-reading (lip reading) and speech correction.

In the teaching of language to deaf children, the proper mode of communication to be emphasized is currently a highly controversial issue. The literature indicates that educators of the deaf hold sharply differing views concerning which of the two major approaches, the manual or the oral, is most effective in promoting the development of a language system, and is of greatest value in equipping the child to function in the hearing world.

The oral method requires that the pupil learn speechreading (lip reading) and oral speech as the only means of communicating with other persons (Reynolds and Birch, 1977). The manual method includes "1) the language of Aigus, a language system consisting of formalized movements of the hands to express thoughts, and 2) fingerspelling using the manual alphabet" (Kirk, 1972, p. 262).

Variations of these two basic methods have been developed, which employ elements of either or both. "Total" communication, for example, requires that the child learn all the skills included in both methods (Reynolds and Birch, 1967). The "combined" approach combines the oral method, with the simultaneous use of fingerspelling. The "simultaneous" method refers to the simultaneous use of oral communication, fingerspelling, and sign language, such that some words are fingerspelled, and others are expressed through sign language (Kirk, 1972).

According to Kirk (1972) the three most prevalent approaches currently in use are the oral approach, the combined approach and the simultaneous approach.

Regardless of the approach adopted, the literature clearly indicates a recent trend toward mainstreaming the hearing impaired child. McConnell (1973) writes, "The rapid increase in early detection, infant and preschool education, and day-class programs of higher quality should result in greater numbers of children able to join the regular educational system" (p. 370).

Programming alternatives range from full integration in the regular classes, to full time residential treatment. The level of integration best limited to the needs of the child depends on the degree of severity, the extent to which the hearing loss has impeded development, the age

at which the problem was identified, and the availability of equipment, services and specialized personnel within the regular school setting.

2. LEARNING DISABILITIES

Introduction

In this section we will attempt to present current theories and knowledge on learning disabilities. This report includes the possible ambiguities as well as the controversial elements of the subject.

Approaches to defining learning disorders are discussed according to six components: intellectual, functional, academic, contradictory, neurological and exclusive dimensions. It is understood that the specialists can use any combination of these six components.

The fact remains that the difficulty of adequately defining the learning disabilities colours other educational fields. Indeed, the statistics on the frequency of these disorders are very inconsistent; their causes are often poorly understood; the diagnostic techniques become useless and there is not yet any markedly efficient educational approach.

All this clearly proves the urgent need for research in this field which would help determine the specific causes of the learning disorders and develop, with far more precision, criteria for defining these difficulties.

To this end the teachers must evaluate very attentively each child who does not learn and carefully modify the child's environment (the program, teaching method, motivating factors) so that any progress the child makes, in whatever form, may be discerned. The following pages are aimed at helping the educator understand the problems confronting the child. They also contain elements which will encourage the teachers to apply educational solutions.

A. Definition and Classification

The most influential and widespread LD definition currently in use is that provided by the National Advisory Committee on Handicapped Children (NACHC, 1968):

Children with specific learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in written or spoken language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, dyslexia, developmental aphasia, etc. . . They do not include conditions which are due primarily to visual, hearing or mental handicaps, to mental retardation, emotional disturbance, or to environmental deprivation.

Since the appearance of the NACHC definition, numerous others have been developed, none of which have achieved any comparable degree of acceptance. As an alternative to presenting the many approaches to LD definition, it is suggested that the various positions taken by LD specialists may be expressed in any combination of the following six definitional components:

1. Intelligence component – in most cases, definitions specify that an LD child is one of average to above average intelligence.
2. Process component – although this component assumes various forms in LD definitions, it is frequently employed to emphasize that an underlying process deficit or disorder is responsible for the manifested learning problem.
3. Academic component – for many specialists, it is the academic difficulties faced by the LD child which is of greatest importance, and which should be the central focus in definitions. Others employ this component to emphasize the causal relationship between underlying process disorders and academic underachievement.
4. Discrepancy component – the LD child is commonly defined as one who exhibits a discrepancy between actual level of performance and estimated level of potential.

5. Neurological component – the use of this component is a highly controversial issue. Some authors allude to CNS etiology in defining LD; others protest that until neurological causes are conclusively identified, they have no place in definitions.
6. Exclusion component – lacking any unanimously accepted criteria of LD, this component is used to ensure that learning problems which are secondary to other handicapping conditions are not diagnosed as LD. Essentially, the exclusion component results in a "diagnosis – by – elimination"; a diagnosis of LD is accepted after all other handicapping conditions have been ruled out.

B. Incidence

Due to the difficulty in defining LD, and the lack of any definitional criteria which can be made operational, the numerous reports of incidence found in the literature are highly inconsistent. Depending on the rigidity vs. leniency of a definition, the estimates of prevalence range from one to 28%.

As the NACHC (1968) states:

The total number of children involved cannot be accurately determined until more adequate diagnostic procedures and criteria have been developed. The disorders may range in degree from mild to severe. While the milder degrees of learning difficulties may be corrected by the classroom teacher, the more severe cases require special remedial procedures. A conservative estimate of the latter group would include from 1 to 3 percent of the school population (p. 14).

Despite the wide range of opinion, the majority of investigators (i.e. Kirk, 1972) are in agreement with the NACHC, and propose that the incidence of LD is between 1 and 3%, with reference to special program requirements.

Both the US office of Education (1974) and the Ontario Ministry of Education (1971) place the incidence of LD at 1%, an estimate which appears to reflect the percentage of school children who require special education services.

C. Causes

In the area of LD, more than in any other area of exceptionality, etiological factors are poorly understood. Although many authors (i.e. Cruickshank, 1977; Kephart, 1971) firmly believe that there is a direct causal relationship between LD and underlying neurological dysfunction, this assumption remains largely theoretical.

There is an abundance of research evidence to support this hypothesis, which has accumulated from studies which have identified electroencephalographic (EEG) irregularities in LD children (Laxton, 1976; Satterfield et al, 1973; Shields, 1973); a dysfunction at the level of the cerebral hemispheres (Bryan, 1975; Galin, 1976); cortical immaturity (Bakker and de Wit, 1977), and various other neurological entities which characterize LD children. However, despite convincing evidence of neurological involvement, research has been unable to elucidate the complex nature of this involvement in terms which qualify as established fact.

For this reason, it is commonly accepted that a child who exhibits typical LD symptomatology suffers some degree of neurological dysfunction, even in the absence of conclusive evidence of CNS etiology. Moreover, confirmation of CNS disorder is not a prerequisite to LD diagnosis.

Numerous investigators have proposed theories which purport to explain the relationship between LD and neurological factors. Both Doman et al (1967) and Ayres (1973) contend that LD represents a disruption at some level of the sequential development through which an individual progresses towards full neurological organization.

Those who adhere to this developmental model of LD may be classified as "delay" theorists, in that it is assumed that LD corresponds to a lag in cerebral maturation.

In contrast, "deficit" theorists propose that LD is related to localized cerebral damage (i.e. brain lesion), which is manifested as an inability to learn, in a child of essentially normal intelligence. Hence, the term "minimal brain dysfunction" (MBD; Clements, 1966) is used in reference to this phenomenon. As the term MBD suggests, it is believed that subtle CNS disturbances at the level of cerebral function exert a minimal influence on learning ability, although gross intelligence is unaffected.

Advocates of both the deficit and delay models share the belief that the CNS disruptions which underlie LD may be traced to complications arising pre-, peri-, or post-natally. Numerous studies (i.e. Leong, 1977; Mednick, 1977; Smith and Wilborn, 1977), for example, have established that a review of early developmental histories of LD children reveals an unusually high incidence of contributory variables. Nichols (1977) cites ten such antecedents: toxemia, fever, cigarette smoking during pregnancy, placental complications, use of mid-forceps, breech delivery, low birthweight, neonatal abnormality and significant respiratory events.

Alternatively, there are others (i.e. Cott; 1972, 1974; Hawley and Buckley, 1974; Pauling, 1968) who contend that biochemical factors are responsible for impaired learning function. Within this general realm, LD has been linked to food additives (Feingold, 1975), nutritional deprivation (Birch and Gussow, 1970), allergic reactions (Crook, 1974) and to genetic neurochemical dysfunctions (Rossi, 1972).

D. Identification and Assessment

In the area of educational and neurological research, the early identification of LD has been given much attention in recent years.

Although it is not yet possible to accurately diagnose LD during infancy, various procedures have been developed which allow for the identification of newborns who are at high risk. Quiros (1976) contends that a large segment of the LD population are children with vestibular (inner ear) disorders and related postural disturbances. Thus, he has outlined a strategy to identify this disorder in newborn infants in order that parents and educators may be sensitized to symptoms indicative of LD.

Otherwise, high risk infants are identifiable on the basis of complications arising during pregnancy or delivery.

The Brookline Early Education Project (BEEP; Pines, 1976) was designed to identify potential LD cases in babies 8-18 months and to provide an appropriate intervention program during the critical years of development.

Similarly, identification methods applicable to nursery school children (3 years) have been reviewed by Graf (1975).

In most cases, however, an LD child enters kindergarten unrecognized. Although some behavioural problems may have presented themselves and although the child has inevitably experienced some learning difficulty, the fact that he otherwise demonstrates average to above average intelligence leads parents to overlook the possibility of any specific handicap.

Accordingly, the literature stresses the importance of implementing an identification program within the school. Project SEARCH (Silver and Hagin, 1976) is only one example of the many instruments recently developed to screen kindergarten children for LD.

Regardless of whether a systematic screening program is employed at the kindergarten level, teachers in the early grades should be trained to recognize the characteristics of LD and to utilize assessment techniques for use in the classroom.

The characteristics which frequently draw attention to the need for further assessment include any of the following: average or above average ability level; hypo or hyperactivity; attention problems; motor problems (poor coordination, tactile-kinesthetic disorders); visual perceptual (i.e. ability to distinguish foreground from background) and auditory perceptual

problems (i.e. delayed speech, poor formulation and syntax); poor work habits; social emotional problems, orientational (spatial and temporal) and academic difficulties (Faas, 1976).

Teachers who recognize the significance of these characteristics may then proceed to further assess the child, using various informal assessment techniques and observational methods. Among those commonly used are High's (in Gearheart, 1977) Pupil Behaviour Rating Scale; trial lessons (Roswell and Natchey, 1971), and the Informal Reading Inventory (Johnson and Kress, 1965).

When potential cases of LD have been identified, by whatever means, the child is then usually referred to persons qualified to conduct a further evaluation of the child. At this stage, the goal of assessment is to determine the psycho-educational significance of the problem and to reach some conclusions as to the type of specialized program best suited to the child's needs.

In this regard, "A generally accepted diagnostic evaluation for individual students should consist of: an educational assessment, an intellectual evaluation, and a medical assessment identifying areas which might affect learning" (Ontario Ministry of Education, 1977).

Briefly, intelligence tests, such as the WISC or Binet, are used to derive a quantitative measure of the child's intellectual ability, and to ensure that the child's problem is not due to low overall intelligence.

According to the literature, the characteristic which differentiates the low IQ child from the LD child is that the poor learning ability of the former is generalized, in contrast to the latter, whose learning problems are specific to one area. Thus, while a low IQ child will score poorly on all subtests of standardized tests of intelligence or achievement, the performance of the LD child is characterized by subtest scatter. Typically, the LD child consistently performs poorly in certain areas, though sub-test scores in other areas are within the average to above average range.

The concept of discrepancy thus represents one of the key ingredients of diagnostic procedures currently in use. As Reynolds and Birch (1977) explain:

The basic concept is this: Some presumed measure of expectance usually mental age or age-grade level, is contrasted with the pupil's actual achievement, such as reading grade level as measured by a norm referenced test. If the actual achievement is substantially below expected achievement (two grade levels is a common demarcation) the discrepancy has been said to denote a . . . learning disability (p. 350).

Discrepancy measures may be derived according to various formulas (i.e. Bond and Tinker, 1967; Harris, 1970; King, 1970; Myklebust, 1968), or following certain procedures for interpreting subtest patterns of scores derived from tests such as the ITPA (Kirk and Kirk, 1971) of the WISC (Bannatyne, 1974). Either of two types of discrepancy measures are viewed to be diagnostic of LD: that the child demonstrate a discrepancy between actual performance and estimated potential, or that the child demonstrate discrepancies among mental abilities.

The process of evaluation generally seeks to obtain information which would indicate that the child demonstrate an inconsistent pattern of strengths and weaknesses. Thus, further to the use of discrepancy measurements, it is necessary to further analyse the child's areas of deficit. In this regard, diagnostic procedures commonly include an examination of performance on achievement tests, (i.e. Wide Range Achievement Test) to determine areas of academic deficit. Perceptual process tests then yield additional information concerning the underlying processes responsible for the academic deficit, and contribute to an understanding of the nature of the child's faulty learning style.

Sabatino and Foster (1974, 1976), Chalfant and Schefflin (1969), and Minskoff et al (1972) are among many who have developed diagnostic strategies for identifying the process deficits underlying the learning difficulty.

Finally, a neurological examination serves to determine whether the child's learning problem is accompanied by any identifiable signs of CNS disorganization (i.e. EEG abnormalities; "soft" signs). Although a negative report of CNS involvement does not discount the possibility of LD, positive neurological findings serve to substantiate an LD diagnosis, and provide valuable information as to its etiology.

E. Educational Needs

Regardless of the age at which an LD child is first recognized, the immediate concern is the provision of an appropriate instructional program.

In some systems, the range of services available for LD students begins with a specialized program at the pre-kindergarten level. Fargo Public Schools (1976) for example offers a pre-kindergarten prescriptive teaching program consisting of six instructional components: language arts, mathematics, science, health, motor skill development, and social experiences. Each of these components consists of sequential skills identified as essential by kindergarten and first grade teachers.

Depending on the severity of the child's learning disability, program requirements may range from part-time withdrawal from the regular classroom to full time residential treatment. Goodman and Mann (1976) explain that within the school setting, "Good programs offer a continuum of services ranging from the self-contained classroom to total mainstreaming" (p. 110). Moreover, they state that, "By far the most appealing service model is the resource room coupled with modification of the regular classroom programs, as opposed to the self-contained classroom" (p. 96).

Approaches to teaching the learning disabled are as numerous and varied as are LD definitions. From a review of the literature, three main categories of approaches to instruction have been identified, corresponding to the three principle etiological positions taken by major theorists. For purposes of this review, these approaches have been labelled as follows: physiological, psycho-physiological and educational.

The physiological approach is represented by all those theories which contend that LD is caused by neurological, or by metabolic dysfunction. Moreover, advocates of either of these physiological models contend that such etiological factors deserve recognition in LD definitions, and in approaches to identification, assessment, and instruction.

Within the general category of physiological theories, the following three approaches have been delineated.

First, neurological "delay" theorists, such as Doman et al (1967) and Ayres (1973), support a CNS developmental lag interpretation of LD; LD is viewed to represent a disruption at some level of neurological development. Accordingly they recommend that educational strategies should seek to re-establish the sequential pattern of normal neurological development. Doman et al's (1967) theory of "patterning" is one such method.

Neurological "deficit" theorists (i.e. Millichap, 1977), on the other hand, suggest the CNS abnormalities underlying LD are such that the causes themselves cannot be treated; that instruction must deal directly with the symptoms of CNS impairment. In other words, the organic deficit that has caused weakness in a specific academic area is in itself irrevocable, but that proper training can nonetheless restore brain processes to normal function.

The third physiological approach consists of those who believe that metabolic factors are responsible for LD. Cott (1972; 1974), for example, proposes that mental processes are affected by the orthomolecular environment of the brain; in LD, improper nutrition disrupts the biochemical balance of this environment, and thus interferes with learning function. It is Cott's contention that megavitamin therapy is required to restore biochemical balance, and to remove the basis of impaired learning in LD. Similarly, Feingold (1975) has proposed a theory of food additives as an explanation for the hyperactivity frequently observed in LD children.

The example of hyperactivity serves to illustrate the way in which these three physiological models differ in terms of their approach to failure to control impulses. Although the pathology itself cannot be removed, impulse control can be acquired, as through behaviour modification techniques, or behaviour can be externally controlled, as through the use of stimulant drugs. Delay theorists would suggest that hyperactivity is due to a delayed development of impulse control. Treatment, therefore, consists of accelerating neurological development, as through motor exercises, beyond the level at which impulse control is normally acquired. Metabolic theorists, who view hyperactivity as a symptom of biochemical disorder,

would recommend strategies such as megavitamins, or nutritional management.

Within the category of psycho-physiological approaches are all those who emphasize the relationship between the psychological processes involved in learning, and the sensory systems through which information is acquired. According to this interpretation, LD represents a dysfunction of those neurosensory operations which organize and interpret sensory experience (i.e. tactile, auditory, visual, kinesthetic).

For psycho-physiological theorists, neurological etiology is recognized only in terms of its relationship to psychological processes. The major emphasis is placed on the identification of deficit processes, and the design of an instructional program aimed specifically at their development.

Depending on the theoretical orientation of the author, differing sense modalities are viewed to be the major source of disruption in LD. For Kephart (1971), for example, "It is logical to assume that all behaviour is basically motor, that the prerequisites of any kind of behaviour are muscular and motor responses" (p. 94). The education of the LD child, Kirk suggests, should consist of motor training activities.

Frostig (1970; 1972; 1973) views LD to be a disorder of any of five visual-perceptual functions; eye-motor coordination, figure-ground perception, constancy of shape, position in space, and spatial relations. Using the DTVP (Frostig et al, 1964) to identify which of these areas is deficit, Frostig then recommends remedial exercises specific to the identified visual process deficiency.

Although there is some variation in terms of the process viewed to be most important in learning, all theories within this group commonly define LD in terms of process deficit. As Reynolds and Birch (1977) explain, "Remediation is aimed at pinpointing and then eliminating or ameliorating the presumed deficits through developmental instruction that matches specific teaching prescriptions with specific deficits" (p. 360). Others within this group recommend educational programs which capitalize on the pupil's unimpaired or strong processes. "For example, when auditory processes are weak or deficient, visual learning is emphasized" (Goodman and Mann, 1976; p. 27).

Multi-sensory approaches are also placed within the category of psycho-physiological theories. Those who adhere to a multisensory approach to LD propose that remediation should not be limited to any one sense modality. Because LD represents a generalized disruption of learning processes, and because no one sensory modality operates independently, the goal of remediation should be to restore inter-sensory organization. The basic premise is that the stimulation of several avenues of sensory input reinforces learning.

The VAKT (visual-auditory-kinesthetic-tactual) method, originally developed by Fernald (1943) is the most comprehensive system of multi-sensory teaching. In the VAKT technique, teaching a new word would consist of having the child see the word, hear the word, say it, trace it, etc. . .

Variations of the VAKT technique have been developed by Blau and Blau (1969) and Gillingham and Stillman (1966).

The third category of approaches to LD education is made up of all those theories which denounce the importance of etiological information in the development of instructional programs. More important than process deficits, or CNS dysfunction in LD, is the fact of a child's academic under-achievement. In other words, regardless of whether a child's reading failure is due to a visual processing disorder, or to CNS damage, the important thing is that the child learn to read.

The educational approach, in general terms, is directed toward the direct teaching of those academic areas found to be deficient, or strengthening areas of weakness in the child.

Ysseldyke and Salvia (1974), for example, follow a task-analysis approach to teaching. These authors advocate the assessment of academic skills development and differential instruction tailored to move the child to the desired level of skill achievement. The emphasis is on component skills and their integration into complex terminal behaviours (Lerner, 1976).

Clearly, approaches to teaching the LD child are numerous and varied, and moreover, no

one of these has yet proven to be significantly more effective than others. For this reason, there are few guidelines which can be followed in developing teaching strategies, and few principles of instruction which can be generalized for all cases of LD. Until LD is more clearly understood, the only approach that LD educators can follow with any certainty is that of individualized instruction.

3. SPEECH AND LANGUAGE DISORDERS

A. Definition and Classification

B. Causes

One of the major problems in defining and classifying speech and language (S-L) disorders is the way in which these overlap into other categories of exceptionalities. As the literature clearly indicates, S-L disorders predominantly occur secondary to other handicapping conditions. Cerebral palsy and deafness, for example, are two such handicaps in which the major difficulty for the child is overcoming problems in the area of speech and language.

For this reason, any discussion of the definition and classification of S-L disorders must necessarily extend into the realm of causes.

Some general definitions of S-L disorders found in the literature include the following:

speech that is so different from the speech of others that it calls attention to itself, interferes with communication, or causes emotional and/or social maladjustment arising from problems of articulation, rhythm, voice tone, or language usage (Ontario Ministry of Education, 1971, p. 25).

defective speech attracts more attention to the speech sounds and accompanying mannerisms than to the content of what the speaker is saying (Reynolds and Birch, 1977; p. 492).

The classification systems employed to further define this type of handicap generally recognize that there are two major types of S-L disorders: the ones which are of organic, or physiological origin, and those which are non-organic, or developmental. Reynolds and Birch (1977), for example, propose a medical classification: disorders of central nervous system (brain) damage (i.e. developmental aphasia); cerebral palsy speech; cleft palate and/or lip speech; structural deformities; slow cognitive development (mental retardation); stuttering or stammering (linked to psychiatric or neurologic conditions) (p. 486).

Furthermore, these S-L disorders may take the form of articulation defects (omission of certain sounds, substitution of one sound for another, or distortion of sounds) or voice problems (relating to quality, rate flexibility, volume and pitch).

Kirk (1972) covers all etiologies - physiological, developmental lag, psychological, cultural, or environmental within a single classification. For purposes of this review, Kirk's categories and sub-categories have been summarized in the following outline:

1. Disorders of articulation:
 1. substitutions
 2. omissions
 3. distortions
 4. additions of sounds
2. Disorders of voice:
 - 1) vocal quality:
 - a) phonation or the production of sounds
 - b) resonance or the direction of the sound in voice placement: 2 types: hypernasal speech and denasal speech
 - 2) vocal pitch
 - 3) loudness/vocal intensity

3. Stuttering
4. Retarded speech development
5. Cleft palate:
 - 1) cleft of lip tissue: medial unilateral, or bilateral
 - 2) cleft of the lip and hard palate
 - 3) cleft of the soft palate
 - 4) cleft of the uvula
 - 5) submucous cleft of the palate
6. Cerebral palsy
7. Impaired hearing
8. Aphasia and related disorders

These eight categories of S-L disorders represent the classification systems which are most widely used by educators of exceptional children. This is evidenced from an examination of the categories delineated by Johnson (1967), Hewett and Forness (1977), Launay and Borel-Maisonney (1975) and van Riper (1972), which indicates that Kirk's classification, although subject to variation, is inclusive of all S-L types. For this reason, Kirk's system will again serve as a basis from which to present prevalent definitions and theories of etiology for each of the specific forms of S-L disorders.

In general terms, articulation defects refers to four characteristic speech errors; as suggested by Kirk (1972), Reynolds and Birch (1977), and the Ontario Ministry of Education (1971): 1) omissions of certain sounds, such as "I like you", 2) substitutions of one sound for another, i.e. "across the woad", 3) distortion of sounds, i.e. "schtop" for stop, 4) additions, i.e. "do-a you-a know."

According to Kirk (1972), "The articulatory mechanism is part of an intricate speaking system, any part of which may show abnormalities of structure or function" (p. 82). From his discussion of this articulatory mechanism it appears that Kirk views physiological factors to be primarily responsible for such speech defects. However, he also points out that if no structural defect seems apparent, etiology may be traced to impoverished environment, infantile preservation, emotional problems, bilingualism, slow maturation, or over-indulgence in the home.

Reynolds and Birch (1977), on the other hand, suggest that, "The errors themselves seldom result from physiological factors. Instead, they appear to be developmental in origin. . ." (p. 494).

While articulation disorders are related to the formation of sounds, vocal disorders refer to defects in the production of sound in the larynx, (Kirk, 1972). Within this category, vocal quality refers to "voices that are so nasal, harsh, or breathy that they interfere with communication" (Reynolds & Birch, 1977, p. 497), or for Kirk (1972), to the phonation or resonance of sound. Vocal pitch problems are those which are noticeably lower or higher than the habitual pitch level for a child's age. Vocal intensity defects are characterized by speech which is of too soft or too loud volume. With reference to etiology, the literature is again divided as to the influence of physiological and of developmental factors.

Stuttering has been defined as "a pattern of speaking in which rhythms of speech are disrupted and broken by excessive or inappropriate prolongations and/or repetitions of sounds, syllables, words, or parts of sentences; usually accompanied by struggle and avoidance behaviour" (Kirk, 1972; p. 87). Launay and Borel-Maisonney (1975) suggest that "le langage est précipité, désordonné entrecoupé d'arrêts, il est souvent incompréhensible" (p. 370).

The physiological-developmental split with reference to etiology is most apparent in discussions of stuttering. Organic theories have linked stuttering to lack of cerebral dominance (Travis, 1957), and to "an epileptic disorder than manifests itself in dyssynergies of the neuro-motor mechanism for oral language" (West, 1958; p. 197). Others question conclusions that stuttering is of organic origin (i.e. Perkins, 1970), and have offered psychological theories, in

which this disorder is related to such factors as "role conflict" (Sheehan, 1970), or "learned behaviour" (Van Riper, 1970).

For Kirk (1972), delayed speech refers to children who "do not develop speech as expected at their age level, or they develop only a partial understanding of language or vocal expression" (p.91). In other words, delayed or retarded speech refers to children whose speech is not defective, but whose language is lagging developmentally. Kirk suggests that such a lag may be caused by hearing loss, mental retardation, emotional disturbance, environmental deprivation, cerebral dysfunction, glandular irregularities, or "congenital aphasia". While these causes are also responsible for S-L disorders which are classified as separate categories, they refer, in this context, to factors which impede overall speech and language development: i.e. to the acquisition of speech and language.

Reynolds and Birch (1977) do not make this distinction between S-L disorders which are developmental, and those which are qualitatively defective, in which etiologies overlap. For these authors, retarded or delayed speech is a term reserved for a type of S-L disorder caused by slow mental development, i.e. mental retardation. It is their contention that slow mental development affects the quantitative component of speech development, or the amount of meaningful verbalization, as well as the qualitative component, or the level of accuracy of oral expression.

Cleft palate speech is "characterized by excessive nasality and inaccurate production of many sounds" (Ontario Ministry of Education, 1971, p. 40), and is caused by a structural deformity of the roof of the mouth and/or upper lip (Reynolds and Birch, 1977).

Cerebral palsy speech refers to S-L problems which vary according to the degree of severity and particular form of the cerebral palsy (Reynolds and Birch, 1977), which affect almost every aspect of speech (Kirk, 1972) and which are related to the neuromuscular disturbance which characterizes cerebral palsy.

S-L disorders associated with hearing loss are symptomatic of the basic underlying, debilitating fact of deafness or auditory deficiency. Denied the natural channel through which the ability to communicate is acquired, S-L disorders appear as difficulties in the acquisition of verbal skills, and as defects in oral expression. As Kirk (1972) explains,

Many children who are hard of hearing have not heard certain sounds accurately and so have developed speech with sound substitutions and other articulatory defects. In addition, because they sometimes do not hear background noises they fail to adjust the loudness of their own voices. . . (p. 261) Aphasia, sometimes referred to as "dysphasia", has been

defined as:

Disorders of linguistic symbolization; the partial or complete loss of ability to speak (expressive dysphasia) or to comprehend the spoken word (receptive dysphasia) believed to be the result of injury, disease, or maldevelopment of the brain (Myers and Hammill, 1976; p. 390).

The prevailing opinion of the etiology of aphasia is typified in Eisenson's et al (1963) statement that it is "a separate syndrome that must be considered among the organic causes of language retardation" (p. 210). The only departure from this position is represented in theories which suggest that the interaction between personality and neurological factors must be recognized. Bannatyne (1976), for example, has posited a "neuropsychological" explanation of aphasia.

Finally, further to the distinction between oral expressive and auditory receptive S-L disorders, many investigators distinguish between two sub-types of aphasia, on the basis of CNS etiology. As Hewett and Farness (1977) explain:

Childhood aphasia usually refers to a language dysfunction associated with some form of central nervous system damage that resulted after language had begun to develop; congenital or developmental aphasia implies that damage to the central nervous system occurred prior to the development of language (p. 127).

It thus appears that while S-L disorders in the form of articulation, voice, stuttering, or retarded speech problems may originate from either physiological or from developmental and environmental factors, those of cleft palate, cerebral palsy, hearing loss, and aphasia are essentially of physiological origin.

C. Incidence

There is some variation in the reports of incidence found in the literature, due to the way in which S-L disorders overlap with other categories of exceptionality, and due to estimates which differ according to whether they include aphasia as a language disorder, as a perceptual handicap, or as a learning disability.

Nonetheless, the majority of estimates of incidence reported are within the range of 3.5 to 5 percent. The Manitoba Teachers' Society (1977) and all ten provincial estimates presented in the SECC report (The Canadian Committee, 1971) place the figure at 3.5%. For the US office of Education, "some 5% of school age children have serious speech problems" (p. 40).

Regardless of this slight discrepancy, investigators are unanimously of the opinion that articulation disorders constitute the largest proportion of S-L problems. According to Kirk (1972), "Approximately 80 percent of speech cases in schools display functional articulation disorders" (p. 49). The US office of Education (1974) breaks down the 5% of children as follows, "most of them (3%) in articulation, the next highest (0.8%) in stuttering, followed by problems due to impaired hearing (0.3%), cleft palate speech, cerebral palsy speech, and voice problems" (p. 40).

D. Identification and Assessment

Unless an S-L disorder develops as the result of physiological or environmental factors which occur abruptly during the later stages of development, problems in the acquisition and expression of language are usually evidenced prior to a child's entrance into the school system. During the preschool years, a child's speech may arouse parental concern because it generally "interferes with communication", or "lacks intelligibility", (Reynolds and Birch, 1977; p. 492), or because it does not permit the "undistracted interchange of verbal language, free from grimaces, phonetic misarticulations, unnatural and unusual voice qualities, speaking rates, and rhythms," (Kirk, 1972; p. 74), or because vocabulary and sound usage are inadequate and inappropriate for the age level.

The maturational cycle for the development of verbal behaviour has been described by Berry (1969) in six sequential stages: prelinguistic vocalization, babbling, imitation, first words, two word sentences, development of syntax (at 2-3 years). Children who do not follow this pattern of normal development may thus call attention to the possibility of an S-L disorder before age three years.

Schaub and Ritenour (1977), who have outlined a "Developmental Disabilities Preschool Language Program", emphasize that optimal development is significantly related to early identification and intervention. As with any preschool screening program, however, there are risks inherent in the early identification of S-L disorders. Armour et al (1977), for example, found that a speech and language screen (using conversation and repetition of a series of sentences) administered to 20,813 preschool children, identified 10.6% of the children as having "possible" speech and language problems. In such cases, as Kisatsky (1967) points out, the major problem is in determining which of these children will overcome their problem in the course of normal development without undue intervention, and which require specialized attention at an early age.

A speech and language program should thus employ a "speech clinician", (Kirk (1972) suggests, who is qualified to screen all children in the early grades to identify those who require further assessment, and to then conclusively diagnose those selected from the initial screening.

With reference to this, Cooper (1977) has described a seven step case selection procedure for speech handicapped children: initial evaluation, the teacher interview, parent interview,

testing chronicity assessment, parental follow-up and enrollment decision.

In the initial screening stage, tests which are frequently used include the Deep Test of Articulation (MacDonald, 1969), the Goldman-Fristoe Test of Articulation (Goldman and Fristoe, 1969), and the Templin-Darley Tests of Articulation (Templin and Darley, 1960).

When test results are indicative of an S-L disorder, the next step is to initiate a three point assessment procedure: intellectual assessment, assessment of defect, determination of causal factors and correlated defects (Kirk, 1972).

The intellectual assessment usually consists of administering standardized intelligence tests (i.e. Weschler Intelligence Scale for Children), in order to determine whether the child's delay in language development or speech defects is related to mental retardation.

Kirk suggests 4 procedures to assess the nature of the defect:

- 1) obtaining spontaneous vocal responses from the child by showing him pictures to be named;
- 2) asking the child to repeat after the examiner certain words which will identify the articulation defect;
- 3) asking the child to repeat sounds in nonsense formation;
- 4) obtaining samples of his habitual conversation (p. 78).

In determining causal factors and correlated defects, "... the speech clinician will assess critically tongue movements and position, alignment irregularities of the teeth, occlusion of jaws, and palate intactness, to note their role, if any, in causing the defect. He will consider other possibilities, including hearing impairment, cleft palate, or cerebral dysfunction" (p. 79).

E. Educational Needs

In selecting an educational program for the S-L disordered child, Hull and Hull (1973) indicate that:

... the selection of any child for individual therapy away from the classroom would be made only after all other possible alternatives had been explored and rejected. The primary goal is to keep the child with a communication problem in the mainstream as much as possible (p. 300).

To accomplish this, one of the most important considerations, the literature suggests, is to establish an effective level of communication between the speech correctionist and the regular classroom teacher. While, for example, serious cases of S-L disorders may require extensive individual therapy outside the regular classroom, all children in the early grades would benefit from speech and language training, without pointing out those who have specific, though moderate S-L disorders (Kirk, 1972). In such cases, the involvement of the speech correctionist in regular classroom activities is important. As Kirk (1972) suggests, "The speech correctionist supervises this type of program, providing the teacher with material and routing procedures."

It is also suggested that for articulation problems in bilingual children, group activity is more profitable than individual attention, because bilingual children tend to share the same kind of difficulties, and because the presence of unilingual non-disordered children is necessary to promote the development of accurate speech (Kirk, 1972).

When individual children must necessarily be withdrawn from the regular classroom, Reynolds and Birch (1977) recommend that the impact of removal must be minimized; i.e. arranging that the child leave before recess break or the end of the day; and that the regular classroom teacher must be prepared to complement this with individualized instruction. Some guidance from the speech correctionist is thus necessary.

Further to these principles concerning programming, the instructional approach for the S-L disordered child must be chosen in accordance with the nature of the defect.

For articulation errors, Reynolds and Birch (1977) outline a three step sequence of instruction.

First, the teacher must ensure that the child hears the error. This means that the child must be made aware of the exact sounds with which he/she has difficulty, and to recognize their correct articulation.

Second, the teacher must ascertain whether the child can produce the sound correctly. Then the child can be brought, through successive approximations, to articulate the sounds correctly.

Third, the newly acquired correct sound must be integrated into everyday speech, and become a part of spontaneous language usage.

Because of the close relationship between the neuromuscular mechanism and voice, voice disorders frequently require an educational program in which a speech pathologist participates. Voice problems, for example, are frequently related to the weak muscular coordination and control characteristic of cerebral palsy. For such problems, Keese (1976) has described the neurodevelopmental treatment of voice deviations common to cerebral palsy victims.

Moncur and Brackett (1974) have developed a comprehensive manual for speech clinicians, in which the management of voice disorders is presented within a physiological and acoustical framework. Training techniques include relaxation, breath control, phonation and resonance, and the chewing method.

For the child who stutters, the major concern of educational management is to eliminate stuttering or to decrease its effect. In the final stage of the development of stuttering, Van Riper (1963) explains, the child becomes fearful of speaking and shows avoidance reactions. Programming must therefore be geared not only toward speech correction, but toward the amelioration of the adverse psychological effects of stuttering.

Historically, numerous theories and approaches have been proposed for the treatment of stuttering. West (1966) describes seven such approaches: 1) psychoanalysis; 2) mental imagery; i.e. developing visualization ability; 3) classical conditioning; 4) negative practice, i.e. removal of stuttering by consciously practising stuttering; 5) general semantics, i.e. Johnson's (1956) diognosogenesis theory; 6) hemispheric dominance, or using the dominant hand in writing and speaking to overcome lack of cerebral dominance; 7) somatic or physiological approaches (Kirk, 1972).

Among current approaches, Bloodstein and Bruitten (1966) suggest that therapy be directed toward two chief goals: the reduction of speech anxieties, and the gradual simplification of stuttering patterns.

Van Riper (1970) also indicates that:

contemporary speech therapy for the stutterer seems to aim at several major goals: 1) to improve the general security and morale of the patient; 2) to reduce the situational and phonic anxiety; 3) to weaken the strength of the stereotyped stuttering response; 4) to increase the threshold of discharge; 5) to reduce the reinforcement the stuttering responses acquire by avoidance, repression, and escape-reward (anxiety reduction and frustration release); 6) to give existing fluency some stimulus value . . . The trend seems to be away from the use of techniques aimed at modifying the stuttering when it does occur, so that the stutterer may stutter and still be fluent (p. 53).

According to Kirk (1972), two relatively new emphases are developing "1) treatment through behaviour modification techniques, and 2) Sheehan's role-conflict theory and treatment" (p. 90).

Sheehan's "role conflict" theory is based on the premise that stuttering arises from the conflict between self and role, it is a "false role" disorder, a role which involves approach and avoidance.

S-L disorders associated with cleft palate are treated through surgery, or through fitting for a prosthetic device, both of which remove the structural abnormality underlying the disorder. As Kirk (1972) explains, "Through adequate surgery and skin graftings at the appropriate growth stages, the physical and cosmetic deformities can be obliterated" (p. 95).

The educational needs of children with S-L disorders related to cerebral palsy, mental retardation, hearing loss, etc . . . are discussed in the sections dealing with these handicaps.

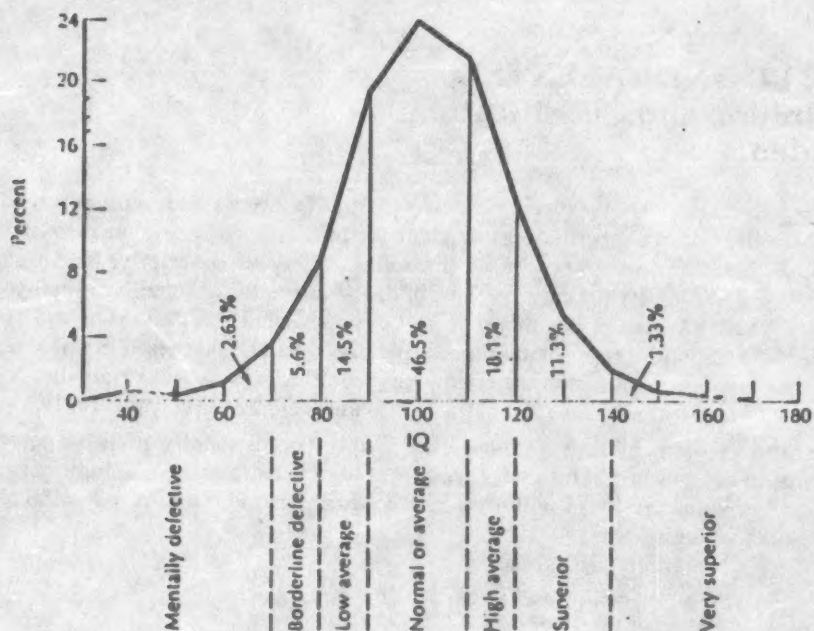
III. INTELLECTUAL EXCEPTIONALITIES

Introduction

Intellectual exceptionalities, in general terms, refers to those children whose level of measured intelligence is outside that range considered to be "average" or "normal", i.e. children who score in the upper or lower extremes on an intelligence scale. Figure 1 illustrates the distribution of IQ scores of the Stanford-Binet formed by Terman and Merrill (1960), which specifies the cut-off scores for seven different levels of intelligence, and the percentage of children included in each. These authors labelled the 46.5 percent of the population who scored between 90 and 110 as normal. Intellectually exceptional children, according to their definition, are those who score above or below these limits.

Kirk (1972) uses the term "mental deviations" to describe these two groups, and calls them "1) Intellectually gifted, and 2) mentally retarded" (p. 9).

Figure 1. Distribution of Composite IQ's



Source: Adapted from Lewis M. Terman and Maud A. Merrill, *Stanford-Binet Intelligence Scale, Manual for the Third Revision Form L-M* (Boston: Houghton Mifflin Company, 1960), p. 18.

(Kirk, 1972; p.9)

According to Cruickshank and Johnson (1975): The intellectually exceptional child encompasses two large groups, each of which presents significant challenges to educators and each of which has essentially different characteristics. In statistical terms, these two groups contain those children beyond two to three standard deviations from the mean in the typical normal distribution. As one extreme are children who are characterized by high mental ability; as at the other extreme are children who may be referred to as slow learning, and mentally retarded (p. 4).

Thus, the literature suggests that children who are intellectually exceptional are those who deviate from the normal on the basis of intelligence, and that this deviation may be of two basic types: above and below normal intelligence.

However, these two major groups are further defined and sub-classified into distinctive sub-categories, due to the way in which either extreme is characterized by inter-individual differences. Children who are above average in intellectual ability, for example, are subdivided by many (i.e. Newland, 1976; Sisk, 1975) into two groups: the gifted and the talented. Children who are below average in intelligence are subject to numerous classifications, resulting in any number of intellectual levels, depending on the interpretation of the author.

The classification of intellectual superiority and inferiority is thus highly variable in terms of the number of sub-groups comprised in each, and in terms of the quantitative cut-offs considered to be the criteria for inclusion or exclusion in these sub-groups.

In order to deal with the major issues concerning the education of the intellectually exceptional child, and to present the more representative approaches to A) definition and classification, B) incidence, C) causes, D) identification and assessment and E) educational needs, each of these topics will be dealt with following the classification accepted by the Ontario Ministry of Education (1971): 1) gifted or talented, 2) a) the educable, b) the trainable mentally retarded.

1. GIFTED AND TALENTED

A. Definition and Classification

B. Incidence

Children who are of above average intellectual ability are defined in numerous different ways. Because the criteria specified in any given definition governs the number of children that definition identifies, and because of the wide variety of descriptive and operational criteria employed in identifying the superior child, the estimates of incidence reported in the literature are equally variable. For this reason, both approaches to definition and classification, and their corresponding approximations of incidence will be discussed in this section.

Gallagher (1975) recommends the following definition which was originally developed by the Advisory Panel on the Education of the Gifted and Talented (Marland, 1971).

Gifted and talented children are those identified by professionally qualified persons who by virtue of outstanding abilities are capable of high performance . . . children capable of high performance are those with demonstrated achievement and/or potential ability in any of the following areas:

1. general intellectual ability
2. specific academic aptitude
3. creative or productive ability
3. leadership ability
5. visual and performing arts
6. psychomotor ability (p. 10).

As Marland (1971) explains, "It can be assumed that the utilization of those criteria for identification of the gifted and talented will encompass a minimum of 3 to 5 percent of the school population" (p. 2).

Newland (1976) more clearly differentiates between children termed "gifted", who have a high potential for conceptualizing, and children who are "talented", whose greatest strengths are in other intellectual activities more related to physique, emotions and leadership. This formulation, which calls for an IQ cut off of between 120 and 125, identifies 8% of children as intellectually gifted or talented.

The SEAP Manual (The Council for Exceptional Children, CEC, 1977) makes the following distinction:

The "mentally gifted" include individuals whose potential is so high or whose level of mental development is so far advanced that they have been identified by professionally qualified personnel as needing additional educational opportunities beyond those provided by the usual school program . . . (POP, p. 4).

The "talented" include individuals identified by qualified personnel as being capable of high performance in one or more areas of special competence. Among those areas of special competence are creativity, leadership ability, social adaptiveness, and facility in the productive and performing arts (POP p. 5).

According to the Ontario Ministry of Education (1971), "Gifted refers to students who have outstanding intellectual ability or creative talent and/or demonstrate consistently superior performance in any socially useful endeavour" (p. 23).

Moreover, it is indicated that such students comprise the upper one to three percent of the school population, based on an IQ cut off score of 130. Within this group, four categories of giftedness or talentedness are recognized:

- a) of very high intelligence, interested in abstract ideas and principals, enjoy learning from books, and adore to marshal thoughts and draw conclusions from what has been learned.
- b) of equally high intelligence but prefer to deal with the concrete solution of problems, enjoy making things manually, inventive and able to construct desired apparatus.
- c) creative, above average intelligence with some special ability, especially in the arts other than painting.
- d) of high intelligence, coupled with social maturity, and the ability to get on with others without sacrificing own ideas . . . (p. 24).

Generally, the definitions cited in the literature appear to be of three types: 1) those which define giftedness as an overall high level of intelligence, and talent as a high level of competency in one specific area i.e. (Kirk, 1972); 2) those which define gifted solely in terms of high IQ, and talent as proficiency in areas other than measured intelligence, i.e. athletic ability, social maturity, etc . . . (i.e. Dowland, 1970; CEC, 1977); 3) those which equate a talent with creativity.

Intelligence tests, such as the Stanford-Binet, or the Wechsler Intelligence Scale for Children (WISC) are the most commonly used instrument for identifying the gifted child (Reynolds and Birch, 1977). According to Kirk (1972), such tests are used to establish incidence rates of 0.5% if an IQ of 140 is the criterion, to 20% if an IQ of 115 is used as the criterion. A breakdown of incidence figures at different criterion levels is provided in Table III.

However, much emphasis is currently placed on the need for developing alternative methods for quantifying superior ability, and the pitfalls of any overdependence on IQ measures (Kirk, 1972). There is a particular need, for example, for improved methods of identifying the talented, who frequently display superior ability, while at the same time score within the normal range of intelligence scales. Getzels and Jackson (1960) and Torrance (1966) have provided evidence that many children score below 130 on IQ tests, yet are highly creative, and suggest that such children are denied the required stimulation when IQ is used as the criteria in identification. In response to this need, there have been significant developments in recent years by investigators (i.e. Lunnebord, 1971; Martinson, 1974) who have attempted to provide various means of identifying talent as an ability distinct from high intelligence. Such methods of identification will be discussed in a subsequent chapter.

Approximate Porportions of School
Population at Various Intellectual Levels

Stanford-Binet	Per Cent of School Population	
	Average Community	Superior Socio- economic Community
IQ above 140	05-10	2-3
IQ above 130	2-4	6-12
IQ above 125	5-7	15-20
IQ above 120	10-12	30-40
IQ above 115	16-20	45-60

Gallagher, 1975; p. 5

Table III

Despite such difficulties in measurement, most investigators recognize that intellectual exceptionalities in the superior range are of two basic types, talented and gifted, and that there is a distinctive qualitative difference between the two. Kirk (1972) for example, views gifted children as those who demonstrate "superior ability to deal with facts, ideas, or relationships" (p. 109).

Moreover, he suggests that:

We can refer to those with special aptitudes in more specific fields as talented, such as:

- the socially talented
- the mechanically talented
- the artistically talented
- the musically talented
- the physically talented
- the linguistically talented
- the academically talented (p. 109).

It is important to note however, that there is much overlap between the two. "These are not distinctive differences since talented children usually are gifted intellectually, and most intellectually gifted children have talent in some area" (p. 154).

Finally, it is important to note that many authors (i.e. Kirk, 1972; Maker, 1977) maintain that the population of gifted children consists of certain sub-groups, such as the under-achieving gifted, the highly gifted, and the handicapped gifted. However, this classification is more appropriately discussed in terms of educational needs.

C. Causes

Inasmuch as research is typically concerned with identifying the causes of educational exceptionalities in order to develop more effective methods of intervention and to focus on prevention, the causes of intellectual superiority are clearly not a priority in the literature.

However, it is known that optimal genetic, neurologic and environmental conditions will ensure that a child's basic potential will be fully realized. While an individual's level of ability is generally believed to be a function of the interaction between constitutional and environmental influences, it is also accepted that at least part of one's developmental potential is determined by hereditary factors. Studies of identical twins raised apart (i.e. Jensen, 1970; Lindeman, 1969) strongly suggest that intelligence is in part a function of genetic endowment. Related to this, Oden (1968), in studying middle age gifted women, found that although their offspring scored slightly lower on IQ tests, they were nonetheless in the exceptional range (average IQ of offspring - 133). Similarly, Terman (1925-1959) found that the mean IQ of 1525 offspring of gifted persons was 132.7.

Neurological influence is clearly recognized by Sumption and Luecking (1960) who define the gifted as "Those who possess a superior central nervous system characterized by the potential to perform tasks requiring a comparatively high degree of intellectual abstraction or creative imagination or both" (p. 87).

Certain environmental factors, both cultural and those related to the home and family, also predispose the development of intellectual superiority.

Although the gifted child is typically the product of a privileged environment, Torrance (1974) observes that gifted, culturally disadvantaged children frequently escape recognition; that children who are outstanding in acquiring the information, abilities, and skills stressed in their own culture are likely to be inconspicuous to persons within the incongruent cultural setting of the school. As Kirk explains "We may conclude that some racial and ethnic groups do tend to produce disproportionate numbers of gifted children, but quite probably because of cultural and value-system differences rather than because of any inherent differences in intelligence level" (p. 126).

The home environment of the gifted and talented child is characteristically highly harmonious. Parents tend to foster self-confidence in the child, to be supportive of intellectual endeavours, to encourage the development of a persevering attitude in dealing with obstacles to achievement and to place a high value on success (Terman, 1925-1959).

Tabakman (1976) studied 110 families of gifted adolescents, and concluded that they were notably more permissive, intellectual, unstructured, and harmonious than the average.

Generally, the home environment of the gifted and talented is one which promotes overall psychological stability, as well as a strong drive to achieve. The high level of psychosocial adjustment among the gifted is well documented in studies which found that the educational and professional achievements of this group are 20 times better than the norm, and that the incidence of crime and psychiatric disturbances, including alcoholism and divorce, is considerably below the average (Oden, 1968).

Thus, while the "causes" of intellectual superiority cannot be conclusively outlined, in that the cause-effect relationship does not follow a definitively predictable pattern, the neurophysiological and environmental factors which seem to predispose the development of giftedness are immediately evident. While an impoverished, disadvantaged, unstable environment may produce a genius, and subnormal ability may arise despite ideal conditions, it is nonetheless a fundamental developmental principle that an ideal neurophysiological system, an absence of interfering variables and a supportive and stimulating environment are the most important factors in predisposing the development of giftedness and talent.

D. Identification and Assessment

Gifted children typically display certain behavioural characteristics which indicate to parents and teachers that an accelerated program is necessary to keep pace with his/her development. Torrance (1974), has developed a "Checklist of Creative Positives", as follows:

1. Ability to express feelings and emotions.
2. Ability to improvise with commonplace materials.
3. Articulateness in role playing and story telling.
4. Enjoyment of and ability in the fine arts – drawing, painting, sculpture, etc. . .
5. Enjoyment of and ability in creative movements, dance, dramatics, etc. . .
6. Enjoyment of and ability in music, rhythm, etc. . .
7. Expressive speech.
8. Fluency and flexibility in nonverbal media.
9. Enjoyment of and ability in small group activities, problem solving, etc. . .
10. Responsiveness to the concrete.
11. Responsiveness to the kinesthetic.
12. Expressiveness of gestures, "body language", etc. . .
13. Humour.
14. Richness in imagery of informal language.
15. Originality of ideas in problem solving.
16. Problem – centeredness.
17. Emotional responsiveness.
18. Quickness of warm-up (p. 481-482).

Torrance contends that these characteristics can be observed without the use of tests, by engaging the child in challenging activities in areas such as visual arts, music, dance, science, etc. . . The importance of early identification, Roeper (1977) suggests, is in helping the child to cope with being different from the average child, and to ensure that lack of intellectual stimulation does not predispose the development of emotional problems.

Methods for identifying intellectual superiority in pre-school children have been described by Kirk (1966) and Blacher-Dixon (1977).

Although the use of standardized intelligence tests continues to be the most prevalent means of identification, there is an increasing dissatisfaction with their effectiveness in screening the gifted and talented. This is largely due to the inherent cultural bias of IQ tests, and to their inability to tap talent in non-academic areas.

Consequently, subjective methods of evaluation, such as Torrance's Checklist, appear with increasing frequency in the literature.

The Alpha Biographic Inventory, for example, developed by Calvin Taylor (Lunnebord, 1971) consists of two separate scales: Creativity and Academic Performance. Malone (1975) has developed an instrument for the "Behavioural Identification of Giftedness" for use with parents of elementary school children, and reports a high accuracy in multiracial and lower income populations.

Despite recent advancements in the area of identification, no one method is yet sufficiently reliable to serve as the sole basis of identification. Reynolds and Birch (1977) emphasize: "In searching for pupils who are potentially gifted and talented, it is our recommendation that every reasonable means be employed" (p. 219). They list six procedures which educators may follow (in order of preference):

1. Individual intelligence test scores.
2. Earlier achievements, including academic record.
3. Teacher nomination based on observations.
4. Standardized achievement test scores.
5. Scores on creativity tests.
6. Scores on group intelligence tests.

If individual intelligence tests are to be used, both Martinson (1974) and Thorndike (1975) recommend that the Stanford-Binet is preferable. Kirk (1972), points out that although individual IQ tests are the best method, they are costly in terms of professional time and service, and are thus impractical in systems with limited psychological services.

Achievement records allow the teacher to examine the child's past performance to determine whether he/she is academically superior to other age equivalent students, and to pinpoint the areas in which the child consistently excels. It is ineffective, however in identifying the unchallenged, unmotivated gifted child whose academic record is unremarkable, or the child who is superior in non-academic areas.

Teacher observation, though ranked third by Reynolds and Birch, has received high recommendation from other authors (i.e. Hilliard, 1976). The use of behavioural scales and checklists in teacher observation is economically feasible, and puts to work the teacher's knowledge of and familiarity with the child's personality and level of development. Johnson (1977) has described what is called the SICCS model (Social Interaction and Creativity in Communication), which is an observation technique for systematically analyzing behaviours associated with creativity.

Despite its advantages, teacher observation techniques cannot be relied upon totally to identify all intellectually superior students. As Reynolds and Birch (1977) point out, teachers tend to overrefer the well motivated, hard working, though average ability student on the basis of good achievement, and overlook "one-fourth to one-third of the most able, according to individual intelligence tests" (p. 223).

Standardized achievement tests, using instruments such as the Wide Range Achievement Test, or the Peabody Individual Achievement Test, are used primarily to provide supplementary information concerning the child's overall academic ability. As a screening instrument, its limitations must be clearly understood in the interpretation of test results. As Kirk (1972) states,

...they detect only children who are achieving academically. Emotional disturbance, family problems, peer-group standards of mediocrity, poor habits, a foreign language background and many other factors may affect a child's ability to perform academically. In the opposite direction, there are some children who because of family pressures, good study habits, or intensive motivation achieve at a higher educational level than is consistent with their other abilities or their apparent mental level (p. 112-113).

Such misjudgements may be of serious consequence to the educational advancement of both types of children; the unidentified gifted child is inevitably prone to frustration when forced to focus attention for prolonged periods on material which is unchallenging and thus uninteresting; the misjudged average child is apt to lose confidence in his/her academic ability when faced with a curriculum which he cannot possibly keep pace with, and will inevitably lose those characteristics which originally led to placement (i.e. perfectionism, diligence, etc. . .)

Creativity tests are being used more and more frequently in the screening process, as more sophisticated tests of creativity are made available, and as high creativity achieves greater recognition as an intellectual exceptionality.

The question of whether creativity is a factor in intelligence or whether the two qualities form a dichotomy is a highly controversial issue (Kirk, 1972). Domino (1976) has provided evidence to suggest that creativity is a function of general intelligence. Similarly, Martinson and Seagoe (1967) and Damm (1970) are among those who view creativity and intelligence as correlated abilities.

Torrance (1967, 1974) and Thies and Friedrich (1977), on the other hand, are representative of a large group of investigators who are strongly opposed to the view that the two are inter-dependant.

This controversy leads to the development of two polarized approaches to the measurement of creativity. Those who accept the former opinion advocate the use of intelligence tests in identifying creativity. Cicirelli (1965) for example, maintains that IQ is the best single criterion for indicating creative potential. More recently, Wallach and Kogan (1976) have taken the same position, supporting the use of IQ measures as indices of creativity.

The opposing argument discourages the practice of identifying creative ability on the basis of IQ test results. As an alternative it is recommended that instruments be used which were designed specifically to tap creativity and which have proven their validity. One of the leading proponents of this view (Torrance, 1974, 1976) has authored one of the most widely used tests of creativity, the Torrance Tests of Creative Thinking, which has been found to yield information on areas of creativity which may not be obtained from traditional measures of intelligence (Holpin et al, 1973). Another diagnostic tool which has established its effectiveness is the Khatena-Torrance Creative Perception Inventory, a biographical measure than can be used to identify creatively gifted adults, adolescents, and upper elementary school children (Khatena, 1977).

Regardless of whether intelligence tests and sub-tests are used, or whether tests specific to creativity are employed in assessment, this component of the identification process is considered to be an essential ingredient in effective programming. Not only does creativity testing improve the accuracy of identification, it yields valuable information about the nature of the child's superiority.

The major advantage of group intelligence tests is their practicality; they are easily administered to large groups of children, and may thus serve as a starting point in selecting candidates for a special program. Otherwise, they are less reliable than individual tests, and fail to differentiate abilities in the upper limits (Kirk, 1972).

Schlichter (1977) has accurately summarized the current trends in identification and assessment practices as they are presented in this review. She discusses three trends in identifying the gifted and talented: the use of multifaced systems, utilizing several measures to derive information on a variety of superior abilities; increased training of teachers and administrators in the recognition of giftedness and talent, and in the use of informal assessment procedures; and increased emphasis on early identification.

E. Educational Needs

Giftedness and talentedness has been slow to establish itself as an area of exceptionality deserving of specialized programming. One reason for this is that society has been reluctant to accept any differentiation of children on the basis of intellectual potential, preferring rather to believe that all children are equal. As Martinson (1973) explains, society is fearful that such an elitist notion is contrary to the value of "equal opportunity". While much of this misconception has been dispelled in recent years, it continues to influence the thinking of persons involved in special education (Reynolds and Birch, 1977).

As a consequence, the special programs offered to the gifted are fewer, comparatively, and less well organized than those for other areas of exceptionality.

According to Kirk (1972),

Special provisions which are made to adapt the school program to the abilities of gifted children include: 1) accelerating, enriching, or grouping children, 2) devising a curriculum suitable to children with high abilities and 3) utilizing appropriate instructional procedures (p. 135).

Acceleration may follow any combination of the following procedures: early school admission, skipping grades, telescoping grades, or early admission to secondary schools or colleges.

Enrichment refers to the adaptation of the regular program to provide educational experiences over and above the regular program. Ginsberg (1976) and Treloar (1976), for example, have pointed out ways in which the gifted and talented can benefit from cooperation between education and the business community. Pinelli (1977) has offered guidelines for the utilization of community resources to encourage scientific creativity. One of the most popular enrichment approaches is Renzulli's (1976) Enrichment Triad Model, which involves general exploratory activities, group training activities and individual and small group investigations of real problems.

Grouping refers to the various ways in which classes may be organized for the delivery of an accelerated and/or enriched program. These include grouping children within a regular class in the elementary school; organizing special sections in the subject matters (i.e. science, visual arts, etc. . .) in the upper elementary and secondary school; providing advanced courses for superior secondary students; offering honour courses for college students. Moreover, grouping gifted children outside the regular class may be organized according to three alternative forms: modified special classes (on a part-time basis), special classes or special school.

The organizational model proposed by Reynolds and Birch (1977) differs slightly from that of Kirk. Table IV provides an overview of their interpretation of the possibilities for instructional arrangements, and indicates the degree to which each segregates vs. mainstreams the child.

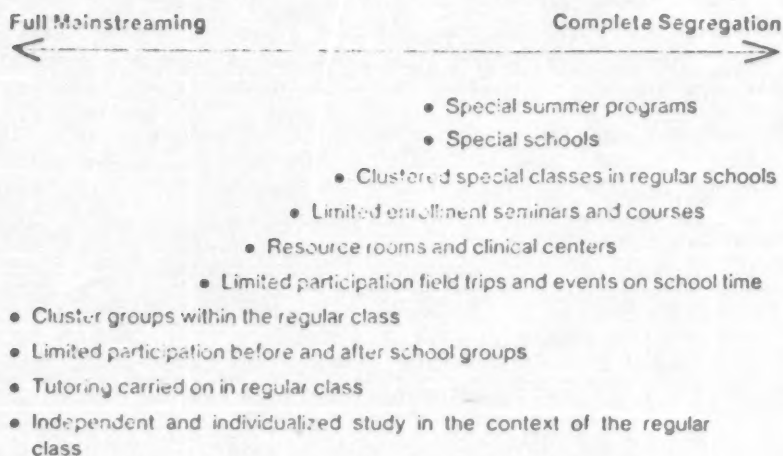
The decision concerning programming and placement ultimately depends on the unique characteristics and needs of the child. However, in reaching a decision, consideration must be given to the general advantages and disadvantages of each type of program. According to the literature the most important consideration in placement decisions is the necessity of keeping the child as much as possible within the mainstream of regular education. Other than obvious financial advantages, enriched/accelerated programs which allow the gifted to remain in the regular class can respond to the needs of the above average child, while at the same time provide an opportunity to interact with children who follow similar trends in physical, emotional and social development (Kirk, 1972).

Among other reasons for striving for maximum integration is that the interaction with average children promotes the development of leadership qualities in the gifted, and conversely, the presence of gifted children in the regular classroom positively influences the achievement of the non-gifted (Kirk, 1972).

Gallagher (1975) points out that the inclusion of the gifted and talented in the regular stream presents few problems in terms of social adjustment. "There is little or no question about the general social status of high-IQ elementary school children. It is high" (p. 39). This is particularly true in the elementary grades, though it diminishes during the secondary years. Moreover, Gallagher found that peer acceptance decreases proportionately to the extent of a gifted child's removal for special instruction.

Table IV

Ways of Organizing for Instruction



Reynolds & Birch, 1977; p. 243

Kirk (1972) has outlined additional considerations, and specific recommendations for placement (listed in Table V) which serve as a guide for program needs.

The curriculum recommended for gifted and talented students is one which is based primarily on that of the regular class, though students are required to follow it "at a faster rate and their comprehension at any given stage should be deeper and more substantial" (Reynolds and Birch, 1977; p. 239).

According to Kirk (1972),

Some of the ways the content can be expanded for the gifted include the following: 1) emphasizing the gross structure and basic principles of the subject matter fields rather than emphasizing individual facts, 2) placing emphasis on how information is derived rather than what is derived, 3) taking the lead from the child's interests and understanding, 4) expanding the curriculum in breadth and depth, 5) providing consultation and guidance (p. 146).

Table V

Considerations in Educational Programming of the Gifted Child

1. When a child's patterns of growth in physical, social, mental, and educational areas are all accelerated beyond the chronological age, acceleration in grade placement may be considered.
2. When the physical, social, and the emotional areas are equal to the chronological age, but the educational achievement is advanced, a special class can be considered.
3. When the school system is too small (not providing sufficient gifted children of a particular kind for a special class), enrichment, tutoring, or special sections within the class for the gifted children in the regular classroom is necessary.
4. When the class in which a gifted child is placed contains a preponderance of children of superior intelligence, even though it is not designated as a class for the gifted, enrichment of the program is probably more desirable than special classes or acceleration, neither of which may be necessary.
5. When the child is gifted but underachieving, special attention to his social and emotional problems or possible areas of weakness is called for. Intensive counselling and parent education or even remedial instruction may be more important for this child than his placement.
6. When inner discrepancies in growth are quite marked, as we often find in children with extremely high IQ's, a tutorial or individualized method of instruction may be necessary if the child is found to be unable to adjust to other situations.
7. When school systems feel that enrichment in the regular grades is the most feasible plan, a special teacher or coordinator for gifted children is advisable. Many feel that it is unrealistic to expect every teacher to furnish enrichment in the regular grades. Teachers need the help of a specialist or consultant.
8. Since the research cited earlier indicates that acceleration by early school admission, skipping or telescoping grades, or early admission to college is not detrimental to the social and emotional development of most of the gifted children, consideration should be given to these procedures. Establishing a fixed chronological age as an entrance requirement, as is done in most school systems, is not taking into account the mental maturity of gifted children, whose mental level may be beyond 7, 8, or 9 when they are allowed to enter school.

Kirk, 1972; pp. 144-145.

Thus, the regular curriculum is expanded and accelerated to conform to the abilities and interests of the gifted and talented.

Within the framework of the aptitude-treatment-interaction model, program organization and curriculum content represent a significant part of the treatment aspect of instruction. The final factor constituting treatment is related to teaching strategies, which, in turn, are personalized to match the unique aptitudes of each gifted and talented child.

Much of the literature deals with a description of specific teaching methods which are derived from certain learning characteristics commonly found in the gifted and talented. Reynolds and Birch (1977) have outlined 3 such characteristics, and three corresponding principles for teaching:

Pupil Learning Characteristics,

1. Learning can move at a faster rate than in other pupils.
2. Learning can attain more complex levels than in other pupils.
3. Self directed learning can begin and can be habituated earlier.

Derived Teaching Principles,

1. Accelerate the pace at which all elements of the curriculum move.
2. Deliberately introduce and teach important abstract concepts and ideas in the skills and disciplines earlier than usual.
3. Expand opportunities for independent study, discovery and synthesis (p. 239).

Kirk (1972) has similarly outlined ten such characteristics, along with teaching suggestions. Kirk's first characteristic is the same as above, to which Kirk adds that drilling and repetition should be avoided; that operations (i.e. in math) may be reviewed by introducing them into more complex problems. Secondly, the superior reasoning ability of the gifted necessitates that teachers be prepared to offer more detailed explanations of problems. In preparing daily work material, teachers must capitalize on this aspect of their thinking, by assuring that all work utilizes the reasoning ability of these students.

Third, the typically large vocabulary of the gifted must be given an opportunity for expression through discussion periods, writing tasks, and debates.

Fourth, the child's keen memory and ability to retain and relate information requires that teachers be cautious not to underestimate their potential for advancement.

Fifth, their insatiable curiosity and sixth, their wide range of interests allows teachers to cross the boundaries of the conventional curriculum.

The high level of social adjustment characteristic of the gifted must be fostered and encouraged in teaching situations. Teachers must avoid the danger of being over-attentive such that the other children feel subject to comparison.

The eighth characteristic, that the gifted tend to be over-critical and dissatisfied with their own achievements, arises when teachers make unreasonable demands of their ability. Though expectations may be geared to demonstrated ability, teachers must encourage a healthy attitude toward mistakes and failures.

The unusual powers of observation of the gifted makes it possible for teachers to correlate and interrelate learning experiences more than the regular curriculum allows.

Finally, and most important, many children show above average creative abilities, which may be developed following any of the numerous approaches provided in the literature (i.e. Torrance, 1967).

These strategies are recommended as corresponding to the aptitudes of the atypical superior child. However, consideration must be given to special sub-groups within the gifted and talented population, whose aptitudes and characteristics deviate somewhat from the norm of this group.

According to Kirk (1972),

There is a minimum of three types of deviating gifted children who will require special attention over and above the provisions being made for gifted children in general. These

are: 1) the underachieving gifted child; 2) the highly gifted; and 3) the gifted child with a handicap (p. 131).

The first group may be made up of minority children from culturally different backgrounds whose area of ability is unrecognized in the dominant culture; or of children who for various reasons are simply unmotivated to achieve at a level commensurate with their above average ability (Reynolds and Birch, 1977).

Maker (1977) has described a program for teaching the under-achieving child which aims at developing the abilities of culturally different children, reducing the discrepancy between actual and potential levels of achievement, increasing self-esteem, eliminating feelings of anxiety, stimulation of curiosity, and improving the parent-child relationship which frequently underlies their low achievement. Fine (1967) discusses the physiological, psychological, and emotional causes of underachievement and presents various approaches to the prevention and treatment of underachievement in the highly gifted. The problem of identifying and educating gifted children from disadvantaged and minority groups has been given extensive consideration by Renzulli (1973, 1975).

One of the key characteristics of the highly gifted (IQ 170 and above) is that, in contrast to the gifted in general, they have a "more difficult time making personal and social adjustments unless they are given special attention" (Kirk, 1972; p. 133). Thus, in addition to a curriculum which is more expansive, and more in-depth than that given to the average gifted, special provisions must be made to minimize the effects of the discrepancy between their development and that of their peers. "The educational procedures used with this type of child are undoubtedly of supreme importance" (Kirk, 1972; p. 133-134). For the extremely gifted child, the literature suggests that tutoring is essential unless there is available a class of comparable gifted children with whom he is compatible in terms of social, emotional, and educational development.

Frequently, children who are handicapped – visually impaired, learning disabled, emotionally disturbed, etc. – are found to be of superior intellectual ability, or to display a high degree of talent in various areas. The general rule, in educating these children, is to combine teaching strategies appropriate to the particular type of handicap with those appropriate to the nature of their superiority.

There is a great deal of literature devoted to the education of the gifted handicapped. Maker (1977) has authored "Providing Programs for the Gifted Handicapped" in which the gifted child who is learning disabled, emotionally disturbed/behaviourally disordered, physically handicapped, and auditorially and visually impaired, is discussed in terms of special education provisions. Maker's major emphasis is "that the single most important thing that the educational system can do is to recognize potential and provide for its development" (p. 37). Moreover, it is important to achieve a balance between teaching to overcome the area of weakness, and teaching to capitalize on demonstrated strengths.

Elkind's (1973) "The Gifted Child With Learning Disabilities" similarly lists program modifications and adaptations which capitalize on the child's strong modalities, while strengthening those modalities which are weak.

Program planners would also find the work of Maker (1976), Mauser (1975), Meeker (1967), Vantour (1976) and Morishima (1974) to be of value in attempting to provide for the needs of gifted handicapped.

Although they do not constitute a special sub-group, the needs of gifted children at the secondary level differ distinctly from those of elementary students, and for this reason, the curriculum for gifted secondary students must be organized differently (Kirk, 1972).

Although the same basic approaches are found in various combinations at the secondary school level, one of the major differences is that the self-contained class commonly found in elementary schools is not usually provided to secondary students. Thus, the student is given greater flexibility in scheduling and choice of subject areas.

Kirk (1972) has listed seven methods for revising the standard curriculum to meet the needs of the gifted and talented student in the secondary school:

1. Increase in counselling and guidance activities.
2. Offering extra curricular activities – school publications, science clubs, hobby clubs, student government and so forth.
3. Organization of advanced classes in science, mathematics, English, and social studies with emphasis on ideas, concepts, and relationship rather than memory.
4. Allowing students to take extra courses to accelerate their graduation.
5. Allowing students to enroll in nearby colleges and universities for more advanced courses.
6. Allowing students to obtain advanced credit by examination.
7. Revision of the sequence and content of courses in sciences, mathematics, language arts, social studies, and languages (p. 143-144).

In conclusion, Schlichter (1977) has summarized the present status of educational programming for the gifted and talented, suggesting that two major trends may be noted: 1) increasing emphasis on training higher order thinking processes, and 2) recognition of the unique role of independent, investigative activities.

2. THE MENTALLY HANDICAPPED

A. Definition and Classification

B. Incidence

In general terms, mental retardation (MR) refers to that portion of the population who are below the average in intellectual functioning. According to the American Association on Mental Deficiency (AAMD; Grossman, 1973),

Mental retardation refers to significantly sub-average general intellectual functioning existing concurrently with deficits in adaptive behaviour and manifested during the development period (p. 11).

According to this definition, sub-average intellectual functioning refers to one standard deviation below the general population on a standardized intelligence test. Impairment in adaptive behaviour refers to deficiencies in maturation, learning, and social adjustment. Within this group, four levels of severity are recognized: mild (IQ 52-67), moderate (36-51), severe (20-35), and profound (under 20).

While general definitions of MR are in basic agreement, and while specialists are consistent in their view that MR must be sub-classified for educational purposes, all consistency stops there. As Table VI clearly indicates, there is much variation in terms of the IQ value employed as the upper limit of MR, in terms of severity classification utilized, and in terms of the range of IQ scores viewed to be representative of each level of severity. Undoubtedly, such a diversity of methods and criteria is paralleled by equally diverse reports of incidence.

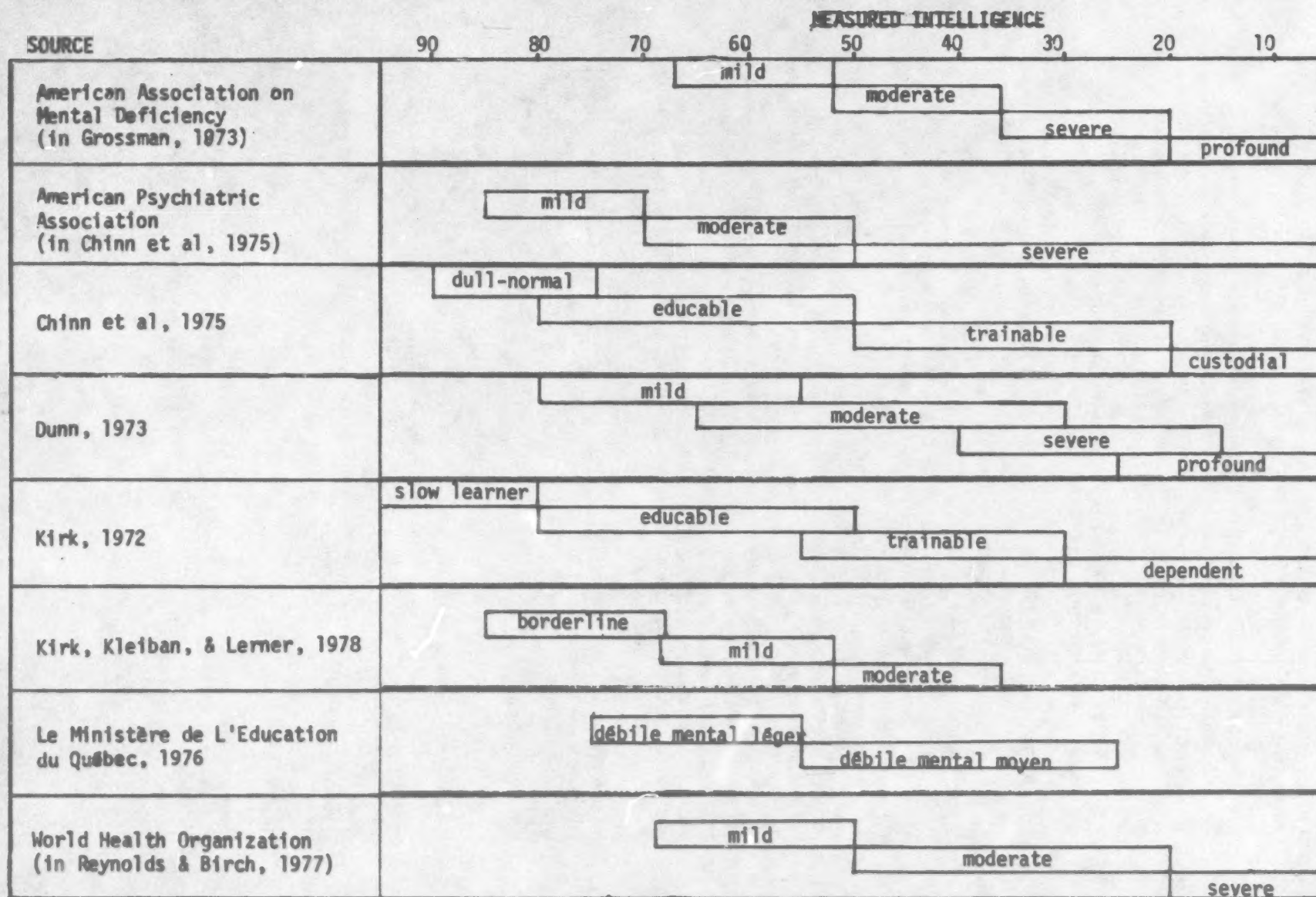


Table VI
SEVERITY CLASSIFICATIONS OF MENTAL RETARDATION FOUND IN LITERATURE

The major split in classification systems appears to be related to the fact while some authors include borderline and slow learning children within the general MR population, others recognize only those children who are wholly unable to cope within the regular classroom.

The Ontario Ministry of Education (1971) follows the former approach:

The slow learner generally can function reasonably well in a regular classroom although typically he will progress at a slower pace than the average child. Students who are educable or moderately mentally handicapped may be unable to function satisfactorily in a regular classroom without special help, but do have the potential for acceptable adjustment in academic, social, and occupational areas when given special educational attention. Pupils who are trainable or severely mentally handicapped have the potential to learn self-care skills in certain routine life activities, such as . . . ; to adjust to home or neighbourhood (but not to total community); and to develop limited economic usefulness in simple and closely supervised work activity. Totally dependent mentally handicapped children, as the term suggests, are unable to survive without close supervision and assistance in the most routine life activities (p. 36).

Kirk et al (1978), though employing a three-level classification, also recognizes the borderline, or slow learning group (IQ range 68-85) "who are among those found at the lower end of their class in academic achievement" (p. 3). These authors contend that the overall incidence of MR, based on an IQ of less than 85, is 16%.

In comparison, Chinn's (1975) description of the "dull-normal" group (IQ 75 or 80 to 90) closely resembles that of Kirk; "capable of competing in school in most areas except the strictly academic areas where performance is below average" (p. 14). However, employing an IQ upper limit of 90 would yield an incidence rate of approximately 23%, according to the theoretical distribution of the Stanford-Binet (see Fig. D).

The interrelated issues of definition, classification, and incidence are further clouded by the fact that numerous other authors exclude this marginal category in their classification of MR. For Le Ministère de L'Éducation du Québec (1976), the incidence of MR is 3.5%; of which 3% are "débile mental léger (IQ 55-75)", and, 5% are "débile mental moyen (IQ 25-55)". Similarly, the Celdic Report (Roberts and Lazure, 1970) places the incidence at 3%: 2.5% EMR, .4% semi-EMR, and .1% totally dependant.

In other words, the major source of discrepancy in reports of general incidence is related to the high concentration of MR cases within the marginal range of intellectual functioning – cases which are recognized as MR by some authors, and excluded by others. Further more, regardless of approach, the overlapping in IQ ranges used in severity classifications underlies the inconsistency in incidence estimates for any of the MR sub-categories.

Generally, a review of the literature reveals that the inclusion of slow learners within the MR group yields incidence figures ranging from 16 to 23%, depending on the IQ criteria used. Most reports of MR incidence, however, are representative of the EMR, TMR, and profound MR categories, and range from 2.5 to 3.5%.

For purposes of this review, four general levels of MR severity are recognized – slow learner, EMR, TMR and profound MR – though greater emphasis will be placed on a discussion of the educational needs of the educable and trainable retarded.

Specific definitions of those categories and the operational criteria employed for each will be presented in a subsequent section.

C. Causes

According to Kirk (1972), there are five classes of MR etiological factors: 1) genetic, 2) prenatal, 3) perinatal, 4) postnatal and 5) cultural.

Genetic factors are those which are transmitted by means of a hereditary trait. Within this category, research has succeeded in establishing the influence of certain biochemical

disorders, such as phenylketonuria (PKU), an inherited abnormality in amino acid metabolism, and galactosemia, a defect in the metabolism of carbohydrate substances. Chromosome abnormalities are also genetically transmittable and are known to cause certain types of MR, such as Down's Syndrome.

Prenatal causes are those which affect the developing embryo and result in maldevelopment of the nervous system and consequent mental retardation. Though there are a wide range of maturational, nutritional, psychological, and physical factors which are capable of causing MR, the best known and most clearly understood are rubella (a measles virus) and the RH factor, in which the fetus inherits an RH factor which is incompatible with that of the mother.

By far the large majority of MR cases (50-65%) are believed to be due to causes occurring prior to birth (Kolb, 1970).

Perinatal causes refer to those conditions which affect the child immediately preceding or during birth.

Approximately 8% of MR cases are believed to result from causes acting at birth (Koler, 1970). This includes brain injuries, asphyxia and prematurity.

Postnatal factors, occurring predominately during infancy and childhood, refer to any condition or disease which insults CNS development and thus affects intellectual functioning. Encephalitis, an inflammation of the CNS, and meningitis, a viral infection, are two examples of postnatal causes of MR.

Cultural factors in the etiology of MR refer to causative factors in the social environment. In general terms, any environment which deprives the child of the stimulation required to promote intellectual development increases the risk of intellectual retardation. Numerous studies, (Hever, 1970; Birch and Dye, 1970, for example), have established the higher incidence of MR in lower socio-economic (SEC) classes, a finding which is attributed to the greater stimulation presumably provided at higher SEC levels. Related to this, Kirk explains that while the occurrence of TMR and profound MR is consistent across all SEC levels, the incidence of EMR is significantly higher in the lower SEC class. This finding suggests that physiological factors are primarily responsible for severe cases of MR, but that MR cases of lesser severity may be either physiological or developmental in origin.

It is estimated that from 25 to 30% of MR cases are due to postnatal factors, including cultural influences (Kolb, 1970).

As research continues to identify specific etiologic factors of MR, more effective measures of prevention may be implemented, and the incidence of MR can be expected to decrease. As Bartram (1974) explains, it is the responsibility of both health and educational professionals to ensure that the body of knowledge pertaining to MR causation is utilized for preventive purposes. "It is possible to bring about more than a 50 percent decrease in mental retardation" (p. 12). Rubella immunization, genetic counselling, and metabolic screening tests are cited as examples of measures which can be integrated within a preventive program. PKU and galactosemia are now diagnosable at birth, and need not result in MR if controlled through diet.

D. Identification and Assessment

For several reasons, methods of identification and evaluation constitute one of the most important considerations in the educational programming of the mentally retarded. Although amniocentesis and neurological and/or laboratory procedures identify many MR cases prenatally, or at birth, these represent a minority of MR children. While such severe cases are easily identifiable during infancy, in that they exhibit distinctive symptoms within the first year, the vast majority of children within this group are those with MR of mild to moderate severity. Within this range, a conclusive diagnosis must usually be deferred until the child is old enough to reach developmental milestones, or until exposed to the social and intellectual demands of a learning environment.

Thus, the great majority of MR children enter school unidentified. According to Freedman et al (1972), of the estimated 3% of children who are MR, only 1% of these are diagnosed during the pre-school years. For this reason, some 2% of MR children rely upon the educational system to recognize their need for specialized programming. Moreover, this percentage may be much higher in that the large number of borderline, slow-learning cases are not represented in this 3% incidence figure.

The Ontario Ministry of Education (Programs and Services for Children and Youth who are Educationally Retarded, undated) suggests that a screening program to identify these children should be implemented as early as possible, and should consist of "Group tests, public health and medical referrals, social workers' referrals, etc. . ." (p. 26). Moreover, the components of individual evaluations are outlined as follows:

- a) Preliminary information concerning factors such as:
 - Physical (auditory, visual, dental, etc. . .)
 - Emotional and social adjustment
 - Foreign language involvement
 - Attendance and school records
- b) Assessment of factors such as:
 - Speech
 - Ability to follow directions
 - Listening skills
 - Reactions to and by fellow pupils
 - Hand-eye and motor co-ordination
 - Concepts of quantity, space and time
- c) Individual intelligence, psychological and achievement test results and observations made during testing (p. 26).

Within this general framework, much attention is inevitably given to the results of intelligence testing. In this regard, it is generally accepted that slow learners are those with IQ's within the range of 75-89, EMR within the range of 50 to 75, TMR within 25-50, and profound MR, below 25 (Ontario Ministry of Education, undated).

In using IQ scores for purposes of educational classification, the cautions pointed out in the literature deserve serious consideration. For one thing, IQ scores vary depending on the type of test used to quantify intelligence. Both Rowe (1977) and Solly (1977) have demonstrated that the revised version of the WISC (WISC-R) is a more rigid test and thus identifies more children as MR than does the WISC. Accordingly, the choice of test must be a factor in establishing IQ cut-off scores for differing levels of MR severity.

Furthermore, although IQ tests are intended as measures of innate intelligence, they are undoubtedly modified by past experience and the social status of the subject (Kolb, 1970). For this reason, Kirk (1972) states, "In evaluating the placement of children with learning disabilities and/or children coming from different sociocultural environments, consideration must be given to research evidence regarding their placement" (p. 201).

In other words, for purposes of differential diagnosis, background information of the child's history and home environment must be used to distinguish between low IQ culturally disadvantaged or learning disabled children, and low IQ MR children.

As Freedman et al (1972) points out, "Mental retardation has to be considered as a multidimensional phenomenon that involves overlapping physiological, psychological, medical, educational, and social aspects of human functioning and behaviour" (p. 313). Essentially, MR should not be viewed exclusively in terms of intellectual deficiency. In assessing the child who demonstrates poor learning ability, equal importance must be placed on psychosocial factors.

The rationale for this recommendation is that during the school years, "social adaptation becomes an important indicator of mental retardation" (Kolb, 1970; p. 302). Because of the MR child's perceptual difficulties and lessened responsiveness to his environment, he typically ex-

periences problems of socialization; problems of adaptation which become most apparent when placed in the highly social milieu of the school.

In attempting to determine whether a child's poor learning ability is due to intellectual deficiency, or whether it is due primarily to other factors, psycho-social measures thus represent important diagnostic criteria.

In recognition of this, the AAMD (Sloan and Birch, 1956) has proposed a behavioural classification of deficit (see Table VII), which consists of two dimensions: measured intelligence, and adaptive behaviour. The measured intelligence dimension is scaled into five IQ levels (see Table VI); the adaptive behaviour dimension classifies four levels of behaviour into two areas of degree: to function and maintain oneself independently, and to meet satisfactorily the demands of personal and social responsibility.

Table VII
Developmental Characteristics of the
Mentally Retarded

	Pre-School Age 0-5 Maturation and Development	School-Age 6-21 Training And Education	Adult 21 Social and Vocational Adequacy
Level I	Gross retardation; minimal capacity for functioning in sensor-motor areas; needs nursing care.	Some motor development present; cannot profit from training in self-help; needs total care.	Some motor and speech development; totally incapable of self-maintenance; needs complete care and supervision.
Level II	Poor motor development; speech is minimal; generally unable to profit from training in self-help; little or no communication skills.	Can talk or learn to communicate; can be trained in elemental health habits; cannot learn functional academic skills; profits from systematic habit training. (Trainable)	Can contribute partially to self-support under complete supervision; can develop self-protection skills to a minimal useful level in controlled environment.
Level III	Can talk or learn to communicate; poor social awareness; fair motor development; may profit from self-help; can be managed with moderate supervision.	Can learn functional academic skills to approximately 4th grade level by late teens if given special education. (Educable)	Capable of self-maintenance in unskilled or semi-skilled occupations; needs supervision and guidance when under mild social or economic stress.
Level IV	Can develop social and communication skills; minimal retardation in sensorimotor areas; rarely distinguished from normal until later age.	Can learn academic skills to approximately 6th grade level by late teens. Cannot learn general high school subjects. Needs special education, particularly at secondary school age levels. (Educable)	Capable of social and vocational adequacy with proper education and training. Frequently needs supervision and guidance under serious social or economic stress.

Sloan and Birch, 1956; p. 261

Mercer (1974) has also developed an Adaptive Behaviour Inventory, which explores competency in the four social systems in which the child lives: the family, the neighbourhood, the school, and the community. This is administered by asking a prescribed set of questions to the child's mother, and is intended for use in the 5 to 11 year range. The Peniston Adaptive Behaviour Developmental Inventory (Peniston, 1975) was developed for the purpose of measuring the adaptive functioning of MR children and adults of all ages. The following nine areas are assessed: eating, dressing, grooming, body awareness, fine motor, gross motor, social, academic, and language.

Similarly, the Vineland Social Maturity Scale (Koll, 1953), and the Denver Developmental Screening Test (Frankenburg and Dodds, 1967) may be used to supplement clinical judgements.

An understanding of the MR child's personal and social competencies is important, not only for differential diagnosis, but to determine educational needs. Having collected all relevant background history on the child, and provided with the results of psychological testing, it is necessary to determine whether the indicated severity of the handicap would allow the child to remain in the regular class, or suggest that the child should be placed in an alternative type of specialized programming. In other words, the diagnostic information is used to establish whether the child is a slow learner, is educable, trainable, or profoundly retarded.

To achieve this, the literature contains numerous examples of MR characteristics, and definitions outlining diagnostic criteria, which may be used as guidelines for educational classification.

The Ontario Ministry of Education (undated) has described the developmental pattern of the slow learning child as follows:

- i) **Preschool Level:**
Difficult to identify; disadvantaged background may indicate a high risk of academic difficulty.
- ii) **Primary School Level:**
Some indications of slowness (especially in the language arts); inadequate development becomes more pronounced with each succeeding year.
- iii) **Intermediate School Level:**
As content of academic areas require increased abstract reasoning, generalization, and conceptual skills, learning problems become more critical, and behaviour problems tend to increase.
- iv) **Senior School Level:**
If the program has been inappropriate, discipline problems (inattention, truancy, apathy, anti-social behaviour, etc. . .) may mask a sense of inadequacy or of failure.
- v) **High School Level:**
Tend to drop-out as soon as the school . . . permits, unless a practical, vocationally - oriented program is provided. With appropriate training, . . . may achieve academic success up to the second year of secondary school.
- vi) **Adult Level:**
Most apt to find employment in semi-skilled jobs or trades (p. 4).

There are few definitions and behavioural descriptions of the slow learner found in the literature. Basically, it is stated that: one, they are the most difficult to identify; two, they are commonly found among those at the lower end of the class in academic achievement; three, the intellectual deficiency becomes more apparent with increasing age; and four, they constitute by far the greatest majority of intellectually deficient children.

The EMR child, on the other hand, is given extensive consideration in the literature. The EMR child, which Kirk et al (1978) refers to as the "mildly retarded" child, is described as one who has potential for development in three areas:

- 1) minimal educability in academic affairs, 2) sufficient educability in social adjustment

to be taught to get along independently in the community, and 3) sufficient occupational educability to become partially or totally self-supporting as an adult (p. 3).

The following growth potentialities are used to describe the EMR child:

1. Ability to function at the second-grade level or higher in reading, writing, and arithmetic by the age of 16.
2. Ability to read and to understand formal arithmetic, which begins sometime within the ages 9 and 12.
3. Rate of mental development approximately one-half to two-thirds the rate of an average child.
4. School progress one-half to two-thirds the rate of an average child.
5. Limited vocabulary and language. But speech and language may be adequate in most ordinary situations.
6. Sufficient social skills to permit the child to get along with people in the community independently.
7. Ability to perform unskilled or semi-skilled work. Mildly retarded adults can usually learn to support themselves partially or in full (Kirk et al, 1978; p. 3-4).

Additional characteristics which may be of interest for diagnostic purposes are as follows:

- A. Short attention span or lack of concentration and participation, reluctant to try something new.
- B. Low frustration tolerance, easily discouraged.
- C. Play interests correspond more closely to those of children of his own mental age than of similar chronological age . . . (Ontario Ministry of Education, 1971; (p. 39)

In contrast, the TMR child is not educable in the sense of academic achievement, ultimate social independence in the community, or occupational independence at the adult level. However, Kirk et al (1978) point out that the TMR child has the potential for learning:

a) self-help skills, b) social adjustment in the family and in the neighbourhood and c) economic usefulness in the home, in a residential school, in a sheltered workshop, and sometimes in a job under supervision. Such a child has the following potentialities.

- 1) Ability to achieve self-care in dressing . . . and other necessary skills, which will make the child independent of parents in the routines of living.
- 2) Ability to get along in the family and in the immediate neighbourhood . . .
- 3) Mental development between one-quarter and one-half that of an average child.
- 4) Ability to learn to assist in chores around the house or do routine tasks for some remuneration in a sheltered workshop, in a residential school, or in a job under supervision.
- 5) Little ability to acquire academic skills such as reading and arithmetic beyond the rote learning of some words or simple numbers.
- 6) Distinctly limited speech and language.
- 7) Ability to learn eventually to protect self from common dangers.

Further to this, the following behavioural characteristics may be used to identify the TMR child:

- A. Likely to be clumsy, uncoordinated, and slow to react.
- B. May not be physically attractive.
- C. May not have complete control of body functions.
- D. Feelings of insecurity

- E. May be unable to communicate wants effectively.
- F. Often hyperactive, distractable, excitable, and likely to have developed little skill in self discipline.
- G. May be lethargic and unresponsive (Ontario Ministry of Education, 1971; p. 39).

The profoundly MR child, variously referred to as the totally dependent, or custodial MR child, is one who:

is unable to be trained in total self-care, socialization, or economic usefulness, and who needs continued help in taking care of his personal needs, such a child requires almost complete care and supervision throughout his life, since he is unable to survive without help (Kirk, 1972; p. 166).

The purpose of presenting these definitions and behavioural descriptions is to demonstrate that despite the variance in IQ ranges for severity levels, the literature is consistent in its consideration of four distinct sub-groups of MR. Regardless of the IQ criteria employed; these sub-groups are identifiable on the basis of the educability and developmental potential of MR children, factors which clearly demonstrate the need for recognition of individuality in developing specialized programs.

E. Educational Needs

Given the basic difference in the developmental potential of MR sub-groups, the first consideration in meeting the educational needs of these children is the organization of programs.

For the slow learning child, whose rate of development is four-fifths to nine-tenths that of the average child (Ontario Ministry of Education, undated), three alternative instructional arrangements are recommended: individual attention within the regular class, by the classroom teacher; regular classroom instruction plus additional teaching by special education personnel; regular classroom instruction, with part-time attendance in special class.

For the EMR child, the latter two types of programs are recommended, and in addition, provisions must be made for children who require full-time instruction in a special class. Kirk (1972) believes that EMR students at the secondary level should attend regular classes for subjects such as home economics, industrial education, physical education, art and music, but should be taught the "tool" subjects – reading, arithmetic, writing, and spelling – in a special classroom.

Kirk (1972) also points out that services for the trainable retarded include special day classes in regular elementary schools, special day schools within the community, residential schools, and sheltered workshops.

The profoundly retarded are usually cared for in residential centres, although many remain in the home.

In determining the program needs of the MR child, the basic maxim is that a placement decision must allow the child to function as much as possible as a normal child. Segregation from the regular class, from the regular school, and from the child's home and community must be minimized.

Although this objective is given repeated emphasis, there is also much research to suggest that while upper levels of MR (IQ 75 to 35) make better educational progress in regular than in special classes, the reverse is true of EMR students (Goldstein et al, 1965). For one thing, MR children in special classes have been found to have a better self-concept, and to be less prone to anxiety than MR children remaining in the regular grades (Guskin and Spicker, 1968).

As Reynolds and Birch (1977) point out, "the quintessence of individualization is reached when each child has the maximum opportunities to learn" (p. 294). Related to this, educators of MR children at all levels of severity are urged to recognize the impermanence of intellectual retardation.

This potential for intellectual advancement is greatest during the preschool years and for this reason, preschool identification and enrichment programs are given top priority by many specialists. According to Kirk (1972), "... when intervention is not introduced at the preschool level, children from inadequate homes tend to retain their rate of development as they grow older. When society offers compensatory education in the form of preschool a reversal of this development is accomplished" (p. 179-180).

Typically, the educational system initially becomes involved with children with slow cognitive development when they begin kindergarten or first grade, usually at age 5 or 6 years. In recent years, however, much evidence has accumulated in favour of expanding very early childhood education for high risk infants (Ramey and Smith, 1977). While some systems have recognized the importance of this expansion, these are in the minority. In Canada, one of the pioneers of this move has been Alberta, where a program has been implemented in which educators and parents work together within a "test-teach" model, developed by Kysela (1976).

According to Reynolds and Birch, (1977), "The instructional program for cognitively slow pupils should extend from the preschool years, beginning no later than age 3, ... and go on through secondary school, with on the job training and placement being part of the sequence leading to graduation (p. 321).

These authors also suggest that not only are MR children capable of higher levels of learning than is normally attributed them, they go on learning during their late teens and 20's if given the opportunity and the incentive.

At all levels of MR severity, the most effective educational program is one which provides maximal stimulation, but which gears the level of curriculum difficulty to the child's learning ability in order to promote a sense of accomplishment.

In presenting the objectives of MR education and the learning principles which are recommended for this purpose, the following discussion deals only with the EMR and TMR groups, but may be extended for use with borderline or profoundly retarded children.

The three major objectives of EMR education have been listed as follows: "1) social competence, 2) personal adequacy, and 3) occupational competence" (Kirk, 1972; p. 198). To these Hewitt and Forness (1974) add "developing basic academic skills" (p. 83).

While it is understood that the EMR program should seek to develop full intellectual potential, the focus of training is primarily toward social adaptation, toward the development of skills which will enable the child to become a productive and self-satisfied member of society. Essentially, the cognitive components of the EMR curriculum are those of the regular curriculum, though the latter is typically "slowed down, simplified, and stretched out" (Reynolds and Birch, 1977; p. 295). In addition, two basic skills are deemed necessary in all curricular areas: 1) thinking critically, and 2) acting independently (Goldstein, 1974; Heiss and Mischio, 1971).

Given these objectives, the principles of learning which serve as a guide to EMR teaching are listed as follows:

1. Never let the child fail.
2. Provide feedback so that the child knows he has responded correctly.
3. Reinforce correct responses.
4. Find the optimum level at which the child should work.
5. Proceed in a systematic, step-by-step fashion.
6. Use minimal change from one step to the next.
7. Provide for positive transfer from one situation to another.
8. Provide sufficient repetition of experiences to develop over-learning.
9. Space the repetitions of material over time.
10. Consistently associate a given stimulus or cue with one and only one response in the early stages of learning.
11. Motivate the child toward greater effort.

12. Limit the number of concepts presented in any one period.
13. Arrange materials with proper cues for attention.
14. Provide success experiences. (Kirk, 1972; p. 214-236)

For the TMR child, the objectives of education are the development of self-help, social adjustment in the home and neighbourhood and economic usefulness (Kirk, 1972). Hewitt and Forness (1974) also include oral language development. For Dunn (1973), these objectives are broadened considerably:

- 1) Self-help, basic readiness and independent living skills development.
- 2) Communication, language and cognitive development.
- 3) Socialization and personality development.
- 4) Vocational - recreational - and leisure - skills development (p. 101).

In general, educational programming for slow learners gears the child toward adult employment in skilled or semi-skilled jobs or trades. For the EMR child, it is geared toward economic independence in unskilled jobs, and participation in community, and home. For the TMR child special education seeks to develop self-care skills and an ability to function in a supervised work program.

In discussing educational objectives, one recent publication of interest is the "State of Ohio Curriculum Guide for Moderately Retarded Learners" (Mays, 1977), which provides a curriculum guide based on the life-long learning needs of MR persons. Behavioural objectives are identified at each of six levels of functioning which approximate the mental age levels of 1.5, 3.0, 5.0, 7.0, 8.0 and 8.0+ (adult) years. The following persistent life problem areas are outlined: 1) developing the ability to communicate, 2) managing one's body, 3) understanding one's self and others, 4) fulfilling home and work responsibilities, 5) developing the ability to travel and 6) developing leisure time alternatives.

In attempting to meet the needs of the MR child, it is also important that teachers acquire an ability to deal with the behavioural and personality difficulties of the mentally retarded. Typically, the MR child has experienced the frustrations of repeated failure, has social adjustment problems as a consequence of perceptual difficulties, has been a source of emotional upheaval in his family, and has been the object of peer criticism in the early years of development. As Kolb (1970) explains, "As with children of normal intellectual endowment, frustrations, humiliations, ridicule, anxieties, emotional deprivations, and insecurities" (p. 320-321) are experienced.

Consequently, the teacher is frequently faced with a child who is more incapacitated by emotional difficulties than by intellectual deficit. In response to this, "Verbal and non-verbal reassurance and praise should be used generously, and situations should be set up that permit the child to succeed. In addition, concrete evidence of affection, in the form of small gifts, toys, and candy is very helpful, as are such pleasurable activities as trips to the drugstore, park, and playground" (Freedman et al, 1972; p. 327).

The literature stresses the efficacy of behaviour modification as a means of promoting the acquisition of social skills, and to discourage maladaptive behaviours (i.e. Mansdorf, et al, 1977). For children who exhibit serious adjustment problems, individual or group psychotherapy may be required, as well as family and/or parental counselling.

In conclusion, it has been suggested that,

The new trends in special education include 1) lessened emphasis on academic performance and greater stress on prevocational and vocational training and on practical life experiences; 2) attempts to recognize all rather than large global units of the child's functioning permitting the precise identification of his assets and building an individual program around these assets; 3) operant conditioning techniques based on the principles of reinforcement of desired behaviour by reward; 4) psychiatric guidance and consultation (Freedman et al, 1972; p. 328)

IV PHYSICAL EXCEPTIONALITIES

Introduction

The areas of exceptionality to be discussed within the general category of physical handicaps are those which the Ontario Ministry of Education has classified as follows: 1) limited vision, 2) orthopaedic and other physical handicaps.

The characteristics common to children within both of these categories is that despite a physical disability which prevents them from learning within the regular classroom, their intelligence and educational achievement do not, as a distinctive feature, deviate substantially from that of the non-disabled child. Accordingly, for both groups, there is little differentiation in terms of the educational content of the curriculum, from that prescribed for the regular class. The major differentiation is in instructional materials and practices.

These however, differ markedly, not only from those used in regular instruction, but within the many sub-groups of limited vision and other physical handicaps, each of which require highly specialized educational programs.

1. LIMITED VISION

A. Definition and Classification

The one outstanding characteristic of literature dealing with visual impairment is its many similarities to that which deals with auditory impairment. In both areas of exceptionality, for example, the factors of age of onset, type of defect, degree of impairment and intellectual level are important considerations for purposes of definition, diagnosis, and educational programming.

Children with visual handicaps fall into three major categories for educational purposes. In the first group are those visually handicapped children whose defect can be corrected through medical treatment or optical aids. The use of corrective devices allows them to be educated within the regular classroom, without modification of school practices.

The second group consists of visually impaired children who can utilize their eyes in learning, but whose level of visual ability remains inadequate, despite corrective measures, for purposes of regular instruction. Although they can use residual vision in learning, and though not considered blind, they require special teaching techniques and materials to learn at an optimal rate.

The third group is made up of the blind, who like the deaf, require instruction primarily through other senses.

The Council for Exceptional Children (1977), defines these latter two groups as follows:

Visually impaired individuals are those whose vision is impaired in any of its functions, as manifested by imperfect depth perception, faulty muscular action, or poor peripheral or central vision (POP, p. 5). Blind individuals are those who are sightless or who have such limited vision they must rely on hearing and touch as their chief means of learning (p. 1).

Operationally, the literature is quite specific in defining the visual impairment of these two groups. As Hewett (1977) explains:

Children are considered blind if they meet either of two criteria. In terms of visual acuity, the child is blind if corrected vision in the better eye is 20/200 or less. This ratio refers to distance and states that the child can see at a distance of 20 feet what a person with normal vision can see at 200 feet. The child may also be considered blind if the widest diameter of his or her visual field subtends an angle no greater than 20 degrees, even though visual acuity in that narrow field may be better than 20/200. If the corrected vi-

sion in the better eye is 20/70, that is, the child can see at 20 feet what the individual with normal vision can see at 70 feet, he or she is considered partially seeing (p. 146).

Thus, the broad classification of visually handicapped children is based on 1) the physical measurements of visual acuity and narrowness of the visual field and 2) the use that is made of the visual sense modality for learning (Kirk, 1972).

However, it has recently come to the attention of various investigators that ophthalmic measurement definitions may be inappropriate for educational purposes. First, advancements in medical research and improvements in corrective devices have made it possible for many children with less than 20/200 vision to make use of residual seeing ability. Secondly, it has been found that children with the same degree of visual defect on clinical tests may have very different visual abilities in terms of learning (Kirk, 1972).

A child with vision of 20/70 to 20/200 for example may be unable to read print which a child with less than 20/200 vision is able to read, using residual ability.

For this reason, Kirk (1972) suggests the following:

New practices, then, have resulted in a revision of terminology. The current terminology for educational purposes is:

1. The visually impaired which refers to those who can learn to read print.
2. The blind, who cannot learn print, but who need instruction in braille (p. 293).

Although visual impairment might also be classified on the basis of type of defect (i.e. refractive errors, defects of muscle function), etiological (i.e. disease, injury), or other factors, these classifications are irrelevant to the provision of services or to teaching strategies, and will not be included in this discussion.

B. Incidence

Because the ophthalmological definition of partial sight as 20/70 to 20/200 and blindness as less than 20/200 vision is one which is currently in standard use, the incidence of visual impairment is consistently estimated at .1% (i.e. Reynolds and Birch, 1977; US Office of Education, 1974). Within this group, approximately .67% are believed to be partially sighted, and .33% blind (Reynolds and Birch, 1977).

There is some, though slight, variation found in the literature however. The Michigan State Department of Education (1974) places the incidence rates of partial and total blindness at 1.63% and .56% respectively. Le Ministère de L'Education du Québec (1972), offers .1% and .015% as incidences for the same two categories.

These figures are representative of visual impairments within the school population alone. Within the general population, the incidence would be considerably higher due to the fact that two-thirds of the total visually impaired group are over 65.

Generally, although visual defects occur in about 20% of persons, the majority of these can be corrected with prescriptive lenses (Reynolds and Birch, 1977). Only an approximated .1% of these are impaired to a degree which cannot be accommodated in the regular classroom.

As research continues to identify causes and to develop medical cures for loss of sight, one can expect that the incidence of both degrees of visual defects will decrease. In addition, as technology develops more effective methods of magnification, one can expect that the incidence of blindness will decrease, and that the incidence of partial impairments will proportionately increase.

C. Causes

The causes of visual impairments have been identified as follows: infectious diseases, accidents and injuries, poisonings, tumors, general diseases, and prenatal influences (including heredity) (Kirk, 1972).

More specific etiological factors have been listed by the Canadian National Institute for the Blind (CNIB, 1974), which found the following conditions to have caused the blindness of new cases registered in 1974 (N-244): retrolental fibroplasia (cause of blindness in 6.5% of new registrants), cataract (8.9%), glaucoma (0.4%), myopia (6.1%), retinal pigmentation (4.8%), optical nerve atrophy (13.7%), uveal choroiditis (.8%), retinal detachment (.8%), macular degeneration (5.2%), albinism (5.2%), corneal and scleral conditions (2.4%), diabetic retinopathy (.4%), nystagmus (9.7%), and "other" (35.1%).

In addition, it was found that 25.5% of these conditions occurred before age 5; 51.5% within the range of 6-15 years; and 23% between the ages of 16-19.

Retrolental fibroplasia (RLF) is responsible for most cases of blindness in young adults today, due to its influence at epidemic proportions during 1952-1953, at which time it accounted for well over half of blindness in pre-school children (Kirk, 1972). It was later discovered that the routine practice of placing premature infants in incubators with high oxygen concentrations left them with severe, and frequently total loss of visual ability. Although conclusive findings that oxygen concentration was responsible for RLF led to a dramatic decrease in its occurrence, RLF has not been eliminated (Loewer-Sieger, 1975).

Similarly, many children who are presently visually handicapped were affected by the rubella epidemic in 1964, which affected an estimated 30,000 infants in the US (Kirk, 1972).

With further advancements in medical research, such as in isolating the rubella virus, developing a rubella vaccine, and in establishing the cause of RLF, it is anticipated that the incidence of visual impairments will continue to decrease.

D. Identification and Assessment

As Kirk (1972) points out, "The importance of an adequate vision screening program cannot be underestimated" (p. 295). Although total blindness is immediately evidenced, partial sight may remain undetected until the child enters school and appears awkward, clumsy, careless, or academically slow, or until specifically evaluated.

Early identification methods are thus concerned primarily with the symptoms of partial sight. The Ministère des Affaires Sociales du Québec (1977) list the following characteristics, which indicate the possibility of limited vision in infants from 6 months:

1. des yeux, d'une grandeur anormale; sensibilité à la lumière; pleurs excessifs; inflammation; hémorragie; mouvement anormal des yeux; i.e. nystagmus.
2. difficulté avec la convergence des yeux ou déviation d'un des yeux après l'âge de six mois (Une déviation persistante de la naissance à six mois doit être considérée comme suspect) (p. 32).

This same report goes on to state:

A partir de l'âge de trois ans, il est possible de commencer à mesurer l'acuité visuelle de l'enfant avec autres techniques suivantes:

1. le "tableau E" (version modifiée de l'échelle Snellen) ou l'occlusion de chacun des deux yeux ou,
2. le "Project-o-chart", ou,
3. Test de convergence et de relief.

Les critères qui, déterminent qu'un test de dépistage est positif sont les suivants:

1. les enfants de trois ans qui ont une vision de 20/50 ou moins;
2. les enfants de 4 à 5 ans qui ont une vision de 20/40 ou moins;
3. les enfants qui ont une différence entre les deux yeux de 20 ou plus;
4. les enfants qui font un strabisme (p. 33).

Then, when the child enters school, characteristics which indicate the need for ophthalmological assessment have been listed as follows:

- A. Strabismus – crossed eyes;
 - B. Nystagmus – quick, jerky movement of the eyes, usually lateral, but occasionally in a rotary or vertical direction;
 - C. the child's use of his eyes – tilting the head, holding objects close to the eyes, rubbing the eyes, squinting, displaying sensitivity to bright lights; and rolling the eyes;
 - D. inattention to visual objects or visual tasks such as looking at pictures, or reading;
 - E. awkwardness in games requiring eye-hand co-ordination;
 - F. avoidance of tasks that require close eye work;
 - G. affinity to tasks that require distance vision;
 - H. any complaints of inability to see;
- (Ontario Ministry of Education, 1971; p. 36)

Reynolds and Birch (1977) also provide a comprehensive checklist of identifying characteristics (p. 608) in which eye movements, the appearance of the eyes, and behavioural symptoms of visual impairment are outlined. If a child consistently presents any of these characteristics, referral for ophthalmological examination is recommended.

The ophthalmologist may then determine first, whether the child is visually impaired, and then the degree and type of the handicap, and if possible, establish its etiology. Etiological information is important in that it may reveal other important characteristics of the child. Certain causative factors (i.e. rubella) for example, place the child at high risk for multiple handicaps. Moreover, the cause of deficit will usually determine the course of medical treatment.

In some cases, ophthalmological treatment will restore vision sufficiently to enable the child to remain in the regular class. Other conditions are less responsive to medical treatment or are untreatable, in which case the ophthalmologist will recommend an educational evaluation for placement purposes.

By age 4 or 5, standard screening devices such as Snellan charts or telebinocular instruments can be used to screen for vision problems and serve to indicate whether ophthalmological referral is necessary.

A diagnosis of impairment, however, represents only a small part of the evaluation process. Additional information which is a prerequisite in determining program needs is the child's social, psychological, physical and intellectual response to restricted ability.

Related to this, one problem is that many of the tests used to assess personality and social adjustment as well as achievement and intelligence were designed for and standardized from sighted children. To assess the intelligence of the blind, Kirk (1972) explains that it is necessary to use verbal tests or performance tests using tactile and/or kinesthetic modalities (haptic). The Hayes-Binet for use with the visually impaired, and the verbal scales of the Wechsler tests are widely used to measure the intelligence of the blind.

According to Kirk (1972), "The general pattern in the development of tests for the blind is to adapt or invent tests of cognitive functioning that require auditory input and verbal or motor response, or a combination of these stimulus-response channels" (p. 308).

Despite these drawbacks, it has been demonstrated that the distribution of intelligence scores for visually impaired children closely approximates that of the normal (Bateman, 1963; Tisdall et al, 1967).

An assessment of motor performance is also of significance to determine the extent to which the special program should emphasize the development of motor coordination and skills. Typically, the blind and partially seeing group are inferior in this area due to their restricted mobility.

Denied the modality through which sensory experiences are normally integrated, the child without or with limited vision may have perceptual difficulty in certain areas. Although most concrete objects may be perceived through touch, it is difficult for a blind child to understand, for example, concrete terms such as mountain, moon, or colours.

Related to this, Cratty et al (1967) studied the motor response of blind children and came to two conclusions. First, laterality is not as well established in the congenitally blind as in the adventitiously blind, since the former demonstrate lack of left-right discrimination. Second, in the absence of auditory cues, the blind veer with a left-right tilt while walking.

Though children typically learn through imitation, the blind child cannot see to imitate, and thus is unable to adopt the expressions and gestures which accompany conversational speech. For example, the facial expression of the blind child tends to be immobile, and they must be taught to speak in the direction of the listener. Such behaviour is frequently misinterpreted by sighted persons, who are often uncomfortable in the presence of a young blind child. This attitude, together with a tendency to be over-protective and show excessive pity, confuses the blind child and may interfere with the child's level of social adaptation.

Thus, assessment procedures should also examine family background, to identify elements which may have hindered development. Moreover, the child's level of social competence should be established, again, to identify areas which need attention.

Surprisingly, blind children tend to be free of personality problems on the whole (Reynolds and Birch, 1977). Blind children display the same range of mental and emotional disturbances as other children, and when maladjustments occur, they are not the consequences of the handicap itself (Ashcroft, 1963). Numerous specialists (Ashcroft, 1963; Reynolds and Birch, 1977; Kirk, 1972) have expressed the opinion that the major problem for the blind is overcoming the negative attitudes of sighted others.

It is important for educators to understand that partially seeing persons, on the other hand, "tend to be less well adjusted than either the blind or seeing" (Lowenfeld, 1973; p. 55). Due to the nature of their condition, which may present a blurred, distorted, or limited picture, they constantly strain to bring the world into focus, a frustration unknown to either the blind or the sighted.

Generally, therefore, the identification and assessment of the visually impaired follows through preliminary screening, ophthalmological referral, and the evaluation of the child's intellectual, achievement, social, etc . . . characteristics.

E. Educational Needs

For the visually handicapped, a pre-school program, beginning in infancy if possible, is essential in order to prepare the child for eventual integration within the regular stream.

As according to Le Plan Quinquennal (Ministère des Affaires Sociales, 1977):

Par la suite, les parents doivent être guidés et conseillés quant à l'éducation pré-scolaire qu'ils doivent assurer à l'enfant afin de maximiser ses chances d'intégration scolaire et sociale (p. 16).

It is during this period that parents require assistance from resources in the community, either through the school or other agencies that are knowledgeable in the education of the visually handicapped.

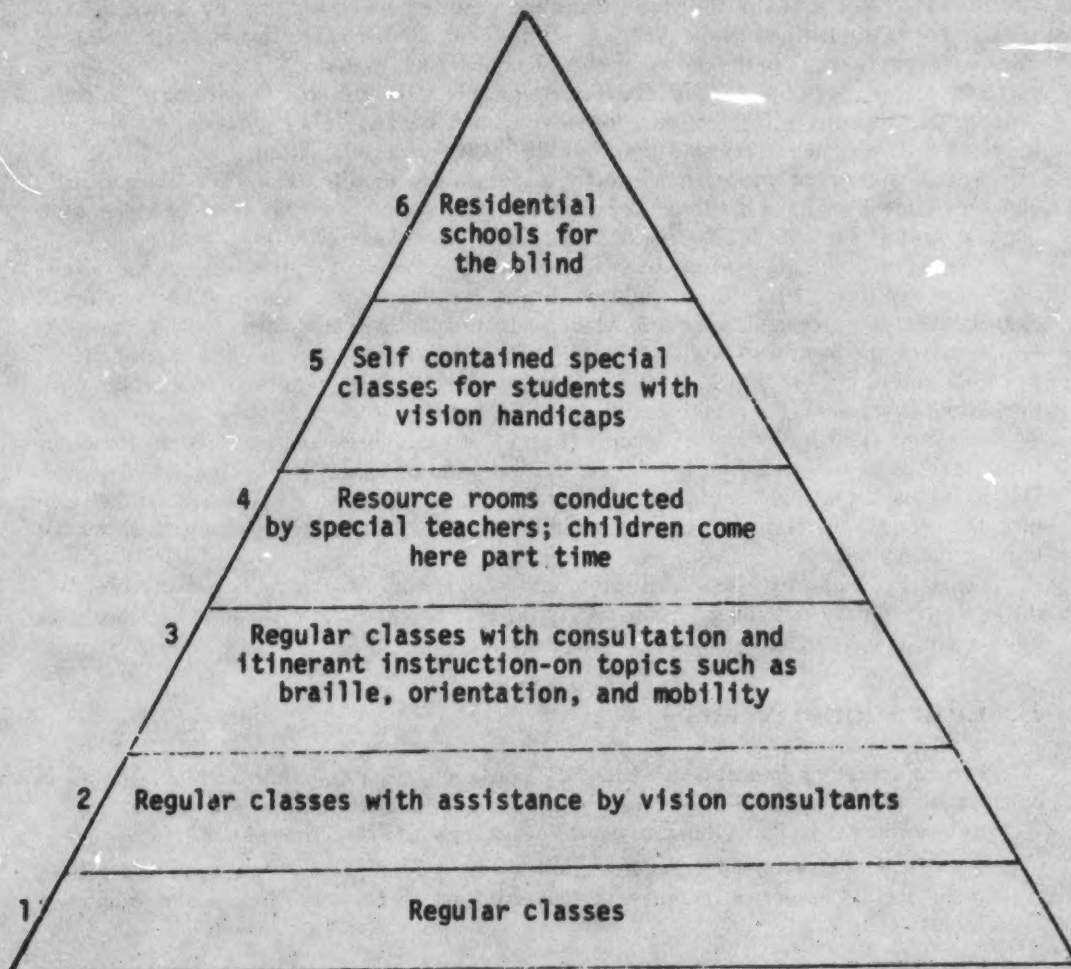
When the child enters the educational system, there are a wide range of programs used to meet the needs of the visually handicapped. Reynolds and Birch (1977) have outlined six levels of educational services, which are illustrated in Table VIII.

Traditionally, the visually handicapped have been educated in self-contained classes, or in special schools. Current practice, however, is "to give similar services to these children in the regular classes through itinerant teachers or resource rooms" (Kirk, 1972; p. 326).

The level of integration best suited to the child depends on numerous factors – the child's overall level of development, socially, intellectually, etc . . . and demonstration of skills necessary to function in the regular classroom; whether the child reads via braille, or via large print; availability of special materials (i.e. tape recorder, magnifier, etc . . .) for use in regular instruction; availability of specialized personnel who can provide services within the regular school setting; knowledge and skills of the regular teacher of visual handicapped education.

Table VIII

Cascade of Services for Vision Handicapped Students



Reynolds and Birch, 1977; p. 619

In special classes, as in residential centres, the major distinction in placement is whether the child can be taught to read print or must learn braille.

The rationale for this trend toward integration is that first, the curriculum of the visually impaired does not differ academically from that of the regular stream; second, the social development of the visually impaired is presently given greater emphasis; and finally, the increasing efficacy of pre-school programs and improvements in special materials now equip the child to function in the mainstream.

Thus, while there is still a need for residential schools, especially during the lower grades, there is an increasing trend toward community day-school programs within the community, and toward organizing a wide range of specialized services within the framework of regular instruction. This is particularly true at the secondary level, where students have had the training and experience necessary to learn in a regular classroom. It is no longer uncommon, for example, to find blind students equipped with special learning aids on the campuses of colleges and universities. Many have received advanced degrees in a variety of professional fields.

According to Kirk (1972):

The curriculum for the visually handicapped must include:

- 1) adaptations of the general curriculum,
- 2) some additional or specialized content,
- 3) specialized materials and equipment (p. 333).

For the partially sighted, one of the major additions to the curriculum is the use of residual vision. Barraga (1970) reports that visual perception may be improved through training, and has developed visual training exercises for blind children with remaining vision for use in both regular and special classes. Auditory and tactile aids are also used to improve learning skills.

The blind are usually taught to read using braille, the Optacon (an instrument which scans print electronically and raises the orthographic features), or other means that do not involve sight.

For both the blind and visually impaired, special learning materials may include any of the following:

- typewriters
- dictaphones, record players and other audio aids
- large print books
- braille writer
- slate and stylus
- abacus
- projection and magnifying equipment
- embossed and relief maps
- the optacon
- computer braille translator
- laser cane

With these special materials, the blind and visually handicapped are able to keep pace academically with their peers. The major modifications of the regular curriculum stem from the necessity of providing comparable experiences which do not involve the use of sight or which utilize whatever visual capacity is available. Consider, for example, that the presentation of learning material for sighted students is believed to be 85% visual (Kirk, 1972). Thus, tactile experiences, verbal explanations, and emphasis on an ability to listen, relate and remember, characterize instruction for the blind and partially sighted.

Additional skills which this group must develop, and the sighted acquire naturally, include a command of their environment. The visually impaired must be taught to move about with ease, to find objects and places, and orient themselves to new or strange physical and social situations.

When a child is first placed in a regular classroom, the teacher's first concern is to introduce the child to objects and places of importance within the class and throughout the school.

Related to this, the visually handicapped child must acquire the skills of orientation and mobility. Emphasis is thus placed on such skills as walking and posture, use of senses, use of auditory cues, avoidance of obstructions and potential dangers, etc . . . The aim here is for independence, and for this reason, it is important for parents and educators to avoid any tendency towards overprotection. The child must be given an opportunity to become as mobile as a sighted child - taking the school bus, walking on busy streets, or using transportation systems.

In conclusion, Reynolds and Birch (1977) have outlined the characteristics of a comprehensive educational program for students with visual handicaps:

1. Early education,
2. Parent education,
3. Individualized school programs,
4. A well oriented regular school staff,
5. High quality leadership by specially trained vision teachers,
6. Materials and equipment,
7. Good models,
8. Good counselling,
9. Screening,
10. Coordination of school and health sciences,
11. School follow-up (p. 633-634).

2. ORTHOPAEDIC AND OTHER PHYSICAL IMPAIRMENTS

A. Definition and Classification

This category of exceptionality refers to children who are: crippled, deformed, or otherwise physically handicapped (exclusive of the visually and auditorily handicapped) and those who have health problems which interfere with normal function in the regular classroom (Kirk, 1972; p. 349).

From an examination of the numerous classification systems of this category which are found in the literature, the following outline has been constructed. In this, three major sub-categories are delineated: neurologic impairments, orthopaedic handicaps, and other health conditions.

- I. Neurologically Impaired
 1. cerebral palsy,
 2. epilepsy,
 3. other (i.e. brain damaged)
- II. Orthopaedically Handicapped
 1. congenital anomalies: (i.e. clubbed feet, spina bifida, lordosis (curvature of the spine), wryneck, etc. . .)
 2. acquired conditions:

- poliomyelitis
- muscular dystrophy
- arthritis
- due to accidents (fractures, amputations, etc. . .)

3. infectious diseases:
 - tuberculosis of the bone
 - osteomyelitis

III. Other Health Impairments:

1. rheumatic fever and congenital heart defect
2. diabetes
3. nephritis
4. respiratory disorders
5. cystic fibrosis
6. asthma
7. tuberculosis
8. anemia
9. allergic conditions
10. malnutrition
11. other

B. Incidence

All neurologic, orthopaedic, and health problems, however mild, are of medical significance. However, of the large number of children who are affected by such medically relevant conditions, only a minority of these require special educational attention. As Reynolds and Birch (1977) suggest, for every 20 children with medical problems, only 4 or 5 of these necessitate special educational programming.

Incidence rates found in the literature thus reflect the percentage of school children who have special education needs due to neurologic, orthopaedic, or health problems. Most incidence figures (i.e. Michigan State Department of Education, 1973; US Office of Education, 1974) indicate that .5% of the school population have such needs. In comparison, Friedman and MacQueen (1971) screened 45,000 Iowa school children, and found that approximately .4% had physical impairments of educational significance. According to the Ministère de l'Éducation du Québec (1972), the incidence of "l'infirmité motrice, la déficience physique, l'épilepsie non-médicalement contrôlée" is .5% and of "l'infirmité motrice - cérébrale" is .175% (Tableau 2.5).

Although it is difficult to estimate the incidences of each of the sub-categories of physical impairments due to variations in classification, it is reported that the incidence of cerebral palsy is .29% (Anderson, 1973).

C. Causes

Due to the numerous types of physical impairments, there are a multitude of factors which may be responsible for neurologic, orthopaedic and health problems. For this reason, and because virtually all relevant etiological factors have been discussed elsewhere in this review, the specific causes of each of the physical exceptionalities will not be delineated here.

In general terms, it may be said that "crippling conditions and chronic illnesses result from congenital or inherited abnormalities, infections, metabolic disturbances, traumatic conditions, progressive diseases, or from unknown or miscellaneous causes" (Hewett, 1977; p. 158).

D. Identification and Assessment

The identification of the physically handicapped (PH) falls primarily within the realm of medical responsibility, as does much of the treatment for these children.

While educators must understand the medical basis of such problems, they are concerned primarily to determine how the child's individual problem requires modifications to the regular curriculum, and the type of special program which best responds to his needs.

The assessment of the physically handicapped child thus seeks to gather information concerning intellectual level, academic performance, social adjustment, motor ability and all other characteristics which may be unique to the child, or which are associated with the specific type of impairment, and which are of educational significance. The cerebral palsied child, for example, may have difficulty writing, and commonly has speech defects, due to neuromuscular disturbance. As the purpose of assessment is to identify program needs, the information viewed to be of importance may vary greatly due to the diversity of PH problems. One child, for example, may require additional special help for a short period of time in order to catch up following a prolonged illness. In such a case, the emphasis is on determining the discrepancy between what the child had covered when the illness began, and the point to which his peers advanced during his absence. For the child who is paraplegic, additional considerations include the child's restrictions in terms of mobility, and whether the school physical design can accommodate the use of a wheelchair. For the cerebral palsied child, it may include an analysis of motor abilities, language development, and speaking skills, in order to identify areas which need special emphasis in an educational program.

In other words, the assessment of the PH child does not follow according to any standard procedure. More than any other area of exceptionality, evaluation methods must be tailored to conform to the needs of the individual child.

E. Educational Needs

A wide spectrum of services may be required to meet the needs of physically handicapped students. According to Reynolds and Birch (1977), six types of programs are essential to the provision of adequate services for physically and health impaired students:

1. Regular class adjustments – for pupils who can do the work of the regular school if minor adjustments in such things as seating, scheduling, and instructional materials can be made.
2. Special day classes in regular schools – for pupils who can attend a regular school but who need a specialist to teach them all or most of the day.
3. Special day schools – for pupils who need a school building and equipment totally adjusted to their needs.
4. Homebound instruction – for pupils who must remain at home either in bed or with extremely limited activity for periods of time long enough to interfere seriously with their education unless special teaching is brought to them at home.
5. Hospital instruction – for pupils who must be hospitalized for medical treatment on a 24 hour per day basis for enough time to constitute a major interruption in education and yet who are well enough for instruction.
6. Residential schools – for pupils who are undergoing long term convalescence or rehabilitation that necessitates living in a specialized setting adapted for that purpose.

Inevitably, one of the major elements in providing programs to PH students is thus interdisciplinary involvement. The parents, regular classroom teachers, resource room teacher, speech therapist, school counsellor, and all other persons involved must establish a working partnership which is focused on meeting the needs of the child. Many of these children, for ex-

ample, require time with occupational and physical therapists, or with vocational rehabilitation counsellors, in addition to the attention given to the academic curriculum.

The general objectives of education for PH students are the same as those for regular students, with the following additional considerations:

1. To develop an ability to utilize adapted materials and equipment to effectively master the basic communication skill of writing.
2. To develop an appreciation for and to achieve independent manual dexterity both in the classroom environment and in the non-classroom environment.
3. To develop an appreciation for and to apply expanded capabilities and competencies in performing basic living skills in the area of personal self-sufficiency (Gearheart, 1974; p. 32).

During the pre-school years Kirk (1972) suggests that the education of the PH child emphasizes the development of motor abilities, language and speech, the psychological factors of visual and auditory perception, discrimination, memory, and social and emotional adequacy.

The elementary school program is an extension of the preschool program in provisions for special help, physiotherapy, occupational therapy, recreational therapy, and speech correction, especially for the cerebral palsied child. During this stage, much attention is given to writing skills, an area which presents much difficulty to the PH child. For the PH child who is severely impaired in terms of communication abilities, the system of Blissymbolics is now commonly taught.

Given appropriate educational care through the elementary grades, PH children will have acquired some degree of independence and will have adjusted to their handicap when they enter high school.

Programs of instruction more closely resemble those of the regular class. The major requirement is in terms of the architectural design of the school, which must provide, for example, ramps for wheelchair use, washroom facilities for the handicapped, etc. . . In more progressive systems, secondary schools join together to organize team sports for the disabled.

V. THE MULTI-HANDICAPPED

Multi-handicapped has been defined as simply, "the presence of more than one handicap in an individual" (Hewett, 1977; p. 182). In other words, a multi-handicap may take the form of any combination of the areas of exceptionality presented in this review.

The SEAP Manual (CEC, 1977) more specifically points to the educational needs of multi-handicapped students: "those who have a combination of two or more handicaps which produce multiple learning, developmental, and/or behavioural problems" (POP, p. 4).

There are few estimates of the incidence of multi-handicaps found in the literature, due to the difficulty in determining the number of children who have more than one handicap, but who are served in a program designed to serve one specific type of exceptionality. Many children who are multi-handicapped are already represented in statistics of other categorical exceptionalities.

As Hewett (1977) explains, "one-half of all exceptional learners have two or more educationally significant disabilities" (p. 184). Of importance for definitional purposes, and for determining the incidence of multiple handicaps, "the term should refer to children with two or more disabilities that are so severe that children so affected cannot profit from an educational program established for any one disability" (Hewett, 1977; p. 182).

According to the US Office of Education (1974), there are .05% of children who qualify for this type of programming. For the Michigan State Department of Education (1973), the incidence of multi-handicapped students is estimated to be .0128%.

Due to the numerous kinds of multi-handicaps, a discussion of the definition and classification, incidence, causes, identification and assessment, and education needs relevant to each type is beyond the scope of this paper. Moreover, all of this review may be viewed within the context of multi-handicaps, in that the education of the multi-handicapped must be based on principles relevant to each type of exceptionality involved.

In conclusion, Reynolds and Birch (1977) propose that,

Most children with severe multi-handicaps, those who are both blind and deaf, or both blind and very slow in cognitive development, for example, are usually served in special school settings. Special units are sometimes established within residential schools, or in community settings, where a spectrum of specialists can combine their resources to serve those complex children (p. 607).

CONCLUSION

In pursuing the goals of special education, the individual needs of each child must undoubtedly take precedence over classification into categorical groups. Nonetheless, such a classification is essential to an understanding of the kinds of problems typically faced by a child with a specific handicap.

This paper has thus followed a categorical approach, in an attempt to provide an integrated review of the literature which may be of practical value to educators in all areas of specialized programming.

Further to recognizing individual needs, as well as those which characterize a particular handicap, certain conclusions may also be drawn which are generally applicable to all types of exceptionalities.

The importance of early identification, for example, has been a major theme of this paper. This theme is given much support in Kendall's (1972) statement that "Only a small number of exceptional children, less than one per cent, are identified before entering school. These include only the severe to profoundly handicapped, the multi-handicapped, the blind, the severely retarded, and the psychotic" (p. 74).

Secondly, the issue of mainstreaming is given much attention in the literature. It is now the opinion of many educational specialists that programs for exceptional students should allow for maximal integration into the regular system. According to this current trend, educational systems must respond, through modifications in program policy and organization. The implementation of a mainstreaming policy involves such considerations as the removal of architectural barriers; and the provision of special equipment, transportation arrangements and consultative and professional personnel to individual schools.

Of major importance, to both mainstreaming and early identification, is that regular teacher education include components on exceptional children. Classroom teachers must develop a capability to recognize the symptoms of impairment, to conduct a meaningful assessment within the classroom setting, and to minimize the effect of that handicap.

A wide range of services are necessary to meet the needs of exceptional children. Service delivery models must be such that any potential program requirement can be met.

Finally, an essential ingredient of special education services is that it utilize all available resources within a framework in which there is a joining of multi-disciplinary responsibility for purposes of assessment, planning and instruction.

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IAN I. DOW, chercheur principal

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*Education for Students with Learning Disabilities:
Guidelines for the Development of Programs and Services.*

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**EDUCATION FOR STUDENTS WITH LEARNING DISABILITIES:
GUIDELINES FOR DEVELOPMENT OF PROGRAMS AND SERVICES**

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CHAPITRE 1

DÉFINITION ET CLASSIFICATION DES DIFFICULTÉS D'APPRENTISSAGE

La question des difficultés d'apprentissage est sans doute actuellement la plus controversée dans le domaine de l'enfance en difficulté. Bien que les troubles d'apprentissage soient maintenant reconnus comme une catégorie distincte d'anomalie et malgré les progrès des dernières années, les spécialistes ne s'entendent toujours pas sur la façon de les définir.

La recherche n'ayant pas encore établi de manière satisfaisante l'étiologie des difficultés d'apprentissage, qui se manifestent sous des formes multiples, aucune définition n'a encore fait l'unanimité.

En l'absence d'une définition concise qui puisse se traduire de façon opérationnelle et servir à l'établissement d'un diagnostic, il est difficile de déterminer le nombre d'enfants qui ont besoin d'aide. Il existe donc peu de moyens à la disposition des éducateurs qui veulent mettre au point un programme complet pour répondre aux besoins des enfants en difficulté. Tant que les difficultés d'apprentissage ne seront pas bien comprises, les tentatives de diagnostics et de correctifs demeureront théoriques.

Aussi, à tous les niveaux du processus pédagogique -- depuis le dépistage jusqu'au placement en programme spécial les difficultés d'apprentissage présentent un défi de taille aux administrateurs de l'enfance en difficulté.

Ce document a donc pour objet d'analyser, à partir d'ouvrages sur le sujet, les problèmes se rapportant aux difficultés d'apprentissage, les définitions et les diagnostics possibles.

La première partie présente des tentatives de définition et de classification. La deuxième porte sur les problèmes qu'entraîne la détermination de la fréquence des difficultés d'apprentissage. La troisième partie montre comment les six éléments que l'on retrouve généralement dans les définitions habituelles -- intelligence, processus, rendement scolaire, écart, problèmes

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d'ordre neurologique et exclusion -- peuvent servir à l'établissement d'un diagnostic.

I. TENTATIVES DE DÉFINITION ET DE CLASSIFICATION

La recherche sur les difficultés d'apprentissage a commencé lorsque les éducateurs se sont rendu compte que certains élèves présentaient des échecs scolaires sans pour autant entrer dans les catégories traditionnelles d'enfants en difficulté. Depuis Strauss et Lehtinen (1974), on a attribué ces échecs à différentes causes: "lésion cérébrale", "dysfonction cérébrale mineure", "retard de maturation", "trouble de perception", "dyslexie", "troubles d'expression ou de compréhension", "difficulté d'apprentissage", etc. (Voir Clements, 1966). Le nombre et la variété des termes utilisés illustrent bien l'absence de consensus chez les chercheurs en ce domaine. Les ouvrages abondent en controverses sur la définition, le diagnostic, l'étiologie et les correctifs des difficultés d'apprentissage. Mais un thème revient sans cesse: la nécessité d'établir une définition satisfaisante pour toutes les disciplines, qui permette d'identifier un groupe homogène d'enfants aux fins de l'établissement de sous-catégories de diagnostic et de programmes correctifs adaptés aux besoins (Ackerman, Peters et Dykeman, 1971).

Actuellement, plusieurs définitions, qui reflètent les différentes tentatives de classification des difficultés d'apprentissage, ont recueilli l'adhésion des spécialistes.

Celle du National Advisory Committee on Handicapped Children (NACHC, 1968), qui met l'accent sur les désordres neuropsychologiques, a été particulièrement retenue:

"Children with specific learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using written or spoken language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. ... They do not include conditions which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance, or to environmental deprivations".

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Cette définition, sans doute la plus généralement acceptée (voir Mercer, Forgnone et Wolking, 1976) a été aussi l'une des plus critiquées (Coleman et Davis, 1976; Hammill, 1976; Wiederholt, 1974). Selon Hammill, elle est "beaucoup trop obscure, générale et subjective pour servir de critère de sélection des élèves".

La faiblesse des définitions actuelles réside dans leur manque de spécificité. Comme le soulignait le ministère de l'Éducation de l'Ontario en 1971 :

"The usual definition is very broad and inclusive. School divisions must functionally define their own language and/or learning disability population by providing information in the functional definition about children who will be excluded; as well as included. Such definition should also have reference to some rather specific cut-off points for exclusion".

La question de l'étiologie est au coeur de ce problème. En effet, lorsqu'on tente de formuler une définition qui désigne des enfants dont les besoins pédagogiques sont semblables, on a recours aux facteurs étiologiques pour distinguer ceux qui présentent des difficultés d'apprentissage et ceux dont les problèmes sont causés par de différents handicaps.

Selon les divers ouvrages sur le sujet, le problème de l'étiologie peut être abordé de trois façons principales, à partir desquelles on peut retenir trois grandes catégories de définitions. Un examen des problèmes qui sont à l'origine de cette divergence fondamentale au niveau de l'orientation théorique permet de faire ressortir les principaux éléments qui compliquent la classification et la définition des difficultés d'apprentissage.

La première, appelée orientation traditionnelle, diagnostique, étiologique ou médicale, met l'accent sur les relations entre le système nerveux central et les difficultés d'apprentissage. En précisant que "cela comprend certaines conditions telles que... lésion cérébrale, dysfonction cérébrale mineure, dyslexie" (Mercer, Forgnone, Wolking, 1976), la définition du NACHC tient compte de l'élément neurologique. Johnson et Myklebust (1967) parlent de "difficultés d'apprentissage neuropsychologiques" pour décrire un comportement

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d'apprentissage qui "a été perturbé par suite d'une disfonction cérébrale, entraînant un problème au niveau des processus d'apprentissage et non une incapacité générale d'apprendre".

Dans ce qu'il appelle "dysfonction cérébrale mineure", Clements (1966) inclut un continuum de troubles neurologiques :

"...refers to children of near average, average, or above average intelligence, with certain learning or behavioural disabilities ranging from mild to severe, which are associated with deviations of function of the central nervous system. These deviations may manifest themselves by various combinations of impairment in perception, conceptualization, memory, and control of attention, impulse, or motor function. Similar symptoms may or may not complicate the problems of children with cerebral palsy, epilepsy, mental retardation, blindness or deafness. These deviations may arise from genetic aberrations, biochemical irregularities, perinatal insults, or other illnesses or injuries sustained in the years critical for the maturation and development of the central nervous system. The definition also allows for the possibility that early deprivation could result in central nervous system alterations which may be permanent".

Cruikshank (1977) insiste également sur le rôle de la fonction neurophysiologique dans les difficultés d'apprentissage, tout en accordant une grande importance à l'environnement dans le développement neurologique :

"... 1) learning disabilities are problems in the acquisition of developmental skills, academic achievement, social adjustment, which are the result of perceptual and linguistic processing deficits. Further defined, learning disabilities 2) may be of any etiological origin 3) may be observed in children and youth of any age 4) of any intellectual function 5) are the result of perceptual processing deficits which, in turn 6) are or may be the result of a (diagnosed or inferred) neurophysiological dysfunction occurring at the prenatal, perinatal, or (in the case of linguistic dysfunction) at the postnatal periods of development".

Cruickshank soutient que la perception étant un processus neurologique, les troubles de la perception reflètent donc une dysfonction neurologique, quelle qu'en soit la cause. Cette opinion se retrouve dans la définition de Wepman (1975), qui établit une équivalence entre les processus perceptifs et neurologiques.

"Specific learning disability refers to those children of any age who demonstrate a substantial deficiency in a particular aspect of academic achievement because of perceptual or perceptual-motor handicaps, regardless of etiology, or other handicapping conditions. The term perceptual is related to those mental (neurological) processes through which the child acquires his basic alphabets of sounds and forms".

D'autres chercheurs ont adopté une position plus souple et accordent moins d'importance aux facteurs neurologiques. C'est le cas, par exemple, du conseil pour l'enfance en difficulté (CEC, Barsch, 1967), pour qui le groupe qui présente des difficultés d'apprentissage comprend, outre les enfants atteints de troubles du système nerveux central, ceux dont les problèmes ne sont pas d'origine neurologique :

"A child with learning disabilities is one with adequate mental ability, sensory processes, and emotional stability who has specific deficits in perceptual, integrative, or expressive processes, which severely impair learning efficiency. This includes children who have central nervous system dysfunction which is expressed primarily in impaired learning efficiency".

Dans une suite à l'étude de Clement (1966) sur la dysfonction cérébrale mineure, Haring et Bateman (1969) proposent deux définitions, qui tiennent encore moins compte de l'étiologie neurologique. La première fait des différences individuelles de rendement le facteur déterminant des difficultés d'apprentissage; la seconde souligne l'écart entre le rendement et les aptitudes. Toutes deux précisent que les enfants qui présentent ces écarts "peuvent démontrer ou non des déviations évidentes dans le fonctionnement du système nerveux central". Nous ne savons pas si, pour les auteurs, seules certaines difficultés d'apprentissage ont un fondement neurologique, ou s'il faut tenir

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compte, même en l'absence de confirmation neurologique, du rôle du système nerveux central.

Quelle que soit l'interprétation donnée à ces définitions, et même si l'importance du rôle du système nerveux central varie selon les auteurs, il est généralement admis que la relation entre les processus perceptifs et neurologiques est suffisamment importante pour entrer en ligne de compte dans la définition des difficultés d'apprentissage.

Parmi ceux qui souscrivent à ce modèle général, plusieurs ont recours à la notion d'exclusion pour définir, à partir de considérations étiologiques, la population ayant des difficultés d'apprentissage. La définition du NACHC (1968), par exemple, exclut les handicaps visuels, auditifs ou moteurs, la déficience mentale, les perturbations affectives et la privation au niveau de l'environnement. Selon le CEC (Barsch, 1967), l'enfant en difficulté d'apprentissage doit "avoir les aptitudes mentales nécessaires, une bonne organisation sensorielle et une certaine stabilité émotionnelle". Pour Haring et Bateman (1969), il faut exclure "la déficience mentale, les privations d'ordre culturel, sensoriel ou éducationnel, ou les perturbations affectives attribuables à l'environnement".

Parallèlement, McIntosh et Dunn (1973), en décrivant les enfants souffrant de troubles d'apprentissage spécifiques graves comme des individus qui "présentent... un écart entre le potentiel d'apprentissage et le rendement dans un... processus d'apprentissage faisant appel à la perception, à la conceptualisation ou à l'expression orale ou écrite ou aux mathématiques", précisent que cet écart n'a pas de rapport avec "la déficience mentale ou autre handicap traditionnel". En définissant les difficultés d'apprentissage comme des écarts dans le développement des aptitudes, Kirk (1972) exclut généralement "les autres handicaps".

Une telle diversité d'opinions préoccupe beaucoup les spécialistes. En effet, selon qu'une définition accorde une responsabilité directe au système nerveux central, élimine certains facteurs par le biais d'une clause d'exclusion ou néglige les causes étiologiques, cela influe considérablement sur la mise en oeuvre des moyens pédagogiques. Par exemple, le fait que Cruickshank (1977) inclue la déficience mentale dans sa définition représente un point de désaccord

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Important entre lui et Underwood (1977). Expriment l'opinion de l'Ontario Association for Children with Learning Disabilities (OACLD), Underwood précise :

"It cannot possibly be argued that learning disabilities do not occur in mentally retarded individuals, but...we must narrow that definition to include, at least, only those children with normal intellectual potential..."

De même, si l'on adopte une définition qui inclut les perturbations affectives comme causes principales des difficultés d'apprentissage (par exemple, Kass et Myklebust, 1969; le NACHC, 1968), cela peut influencer considérablement sur les décisions définitives d'un système scolaire donné en matière de diagnostic.

Mais la controverse entourant l'étiologie est surtout axée sur les questions d'ordre neurologique. Il ne faut pas oublier, comme le souligne Grotberg (1970), que les pressions du milieu extérieur peuvent influencer sur le développement neurologique de la même façon que les conditions internes : "Un système nerveux qui ne se développe pas peut en effet produire les mêmes symptômes en matière de difficultés d'apprentissage qu'un système nerveux endommagé". Des études ont en effet démontré qu'il y a une plus grande fréquence de troubles neurologiques chez les enfants issus de milieux défavorisés (Passamarick et Knoblock, 1961; Birch et Gussow, 1970). Aussi accuse-t-on bien des définitions (entre autres, celle du NACHC, 1968) de ne pas tenir compte des besoins des enfants défavorisés en excluant spécifiquement les facteurs de privation culturelle (Herrick, 1973).

Le problème est d'autant plus complexe qu'il est souvent impossible de vérifier les dommages du système nerveux central chez les enfants présentant des symptômes typiques de difficultés d'apprentissage. Par ailleurs, une dysfonction établie du système nerveux central n'est pas nécessairement accompagnée de difficultés d'apprentissage (Stevens et Birch, 1957).

Aussi, bien des spécialistes ont adopté une démarche pédagogique axée sur l'éducation, le comportement et les éléments correctifs, de préférence à l'orientation traditionnelle. Ils contestent la valeur des facteurs neurologi-

ques ou étiologiques dans l'établissement d'un diagnostic, et soutiennent que les difficultés d'apprentissage doivent être définies en fonction du comportement et non des causes et des symptômes. Cette orientation est fondée sur la conviction que la définition et le diagnostic établis à partir de l'étiologie sont inutiles, et que la cause des difficultés d'apprentissage a peu de rapports avec la mise au point et à l'analyse des programmes pédagogiques.

Valett (1969), qui défend ce point de vue, laisse complètement de côté la question de l'étiologie en définissant ainsi les difficultés d'apprentissage : "...any specific difficulty in acquiring and using information or skills that are essential to problem solution".

Farrald et Schramber (1973) mettent ouvertement l'accent sur l'aspect pédagogique et soutiennent que les enfants présentant des difficultés d'apprentissage sont "... des enfants qui -- pour une raison quelconque -- ne parviennent pas à atteindre les objectifs du programme scolaire et qui, en raison de caractéristiques d'apprentissage particulières, ont besoin pour apprendre de techniques d'enseignement entièrement révisées.

Cette description rejoint celle de Kass et Myklebust (1969) :

"...one or more significant deficits in essential learning processes requiring special education techniques for their remediation. Children with a learning disability generally demonstrate a discrepancy between expected and actual performance in one or more areas, such as spoken, read, or written language, mathematics, and spatial orientation".

Outre ces deux grandes orientations, qui expriment des opinions extrêmes relativement à l'étiologie, une troisième rallie les plus modérés. Elle est fondée sur les prémisses suivantes : les facteurs reliés au système nerveux central sont de peu de valeur pour la compréhension des difficultés d'apprentissage dont il faut chercher la cause au niveau des processus de perception.

En résumé, ceux qui préfèrent définir les difficultés d'apprentissage comme des déficiences au niveau des processus admettent généralement l'existence d'un lien entre les difficultés scolaires et une dysfonction sous-jacente des processus de perception, d'intégration ou d'expression (Bateman,

1967). L'orientation est alors étiologique et reconnaît l'existence d'une dysfonction dans la perception, mais elle ne s'étend pas au domaine des explications neurologiques. En outre, même si l'accent est mis sur la correction des troubles de la perception, on souligne qu'il ne suffit pas de comprendre uniquement le comportement observable pour établir une définition et un diagnostic pédagogiques.

Selon Vaughan et Hodges (1973) et Li (1977), la plupart des définitions font référence aux déficiences au niveau des processus. Cette orientation, qui met l'accent sur les rapports entre les difficultés d'apprentissage et les déficiences de la perception, est à la fois la pierre angulaire de la pratique en cours et la conception la plus controversée.

L'hypothèse d'un lien entre les difficultés d'apprentissage et les déficiences de la perception, et les tests qui servent à dépister ces dernières, ont fait l'objet de nombreuses critiques qui seront analysées plus loin.

Si l'on passe en revue les ouvrages traitant des difficultés d'apprentissage, on se rend compte qu'il existe deux grandes orientations étiologiques diamétralement opposées, et une troisième orientation -- sorte de compromis entre ces deux extrêmes, qui met en cause des déficiences au niveau des processus d'apprentissage. Cependant, personne n'a encore réussi à mettre au point une définition qui fasse l'unanimité.

Il semble donc n'y avoir aucune méthode connue de classification des difficultés d'apprentissage. Dans l'état actuel de la recherche neurologique, les difficultés d'apprentissage ne peuvent être clairement définies sur la base de l'étiologie : c'est là la principale raison qui empêche de bien les comprendre. Certains soutiennent que les facteurs étiologiques sont des paramètres importants de définition et de diagnostic. D'autres, qui prétendent que la classification doit se faire à partir des caractéristiques d'apprentissage de tous les enfants qui ont des difficultés scolaires, quelle qu'en soit la cause, préfèrent une définition qui tienne compte des aptitudes et du rendement scolaire.

On espère qu'ainsi les enfants d'un groupe donné présenteront des profils de tests et de comportement semblables, et non seulement des éti-

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quettes semblables, ce qui permettra de les regrouper de manière plus homogène (Anderson, 1976).

Pour Frierson et Barbe (1967), ces deux orientations sont axées l'une sur les causes et l'autre sur les effets. Alors que la première s'intéresse à l'étiologie, la deuxième analyse, décrit et modifie les comportements observés et permet souvent de dépister d'autres enfants qui ont des besoins spéciaux sans toutefois présenter de difficultés d'apprentissage (Faas, 1976).

En général, en raison du grand nombre de facteurs influant sur la façon d'apprendre d'un enfant "it is difficult for us to use present diagnostic information to adequately group children for educational purposes" (McDonald, 1968). L'auteur ajoute : "unless one is able to pin down the parameters being used... It is virtually impossible to know the exact population of children in which he is interested".

Selon Wiederholt (1974), la reconnaissance actuelle des difficultés d'apprentissage a été précédée par deux étapes : une phase de formation, durant laquelle on s'est intéressé surtout à la nature et aux causes des difficultés d'apprentissage spécifiques, et une phase de transition, caractérisée par les efforts faits pour utiliser ces connaissances dans le domaine de la pratique corrective. Au cours de la période actuelle, la phase d'intégration, on assiste à la fusion des contributions théorique et clinique des auteurs qui s'intéressent aux trois types de difficultés - dans le domaine de l'écriture, du langage, de la perception et de la motricité -- et qui adoptent une conception globale orientée vers le diagnostic et le traitement. Wiederholt souligne toutefois que le manque de communication entre les spécialistes des trois types principaux de difficultés d'apprentissage et ceux des deux principales orientations a empêché tout progrès réel au cours des dernières années.

L'absence de cohérence entre les différentes interprétations des déficiences classées sous l'appellation générale de difficultés d'apprentissage donne amplement raison à Wiederholt. Kephart (1971), pour qui toutes les difficultés d'apprentissage proviennent de déficiences perceptivo-motrices, distingue celles qui sont reliées au niveau de développement de certains domaines secondaires du comportement perceptivo-moteur. Selon Valett (1969), les

difficultés d'apprentissage appartiennent à l'un des six domaines de discrimination suivants : développement moteur global, intégration sensorimotrice, aptitudes perceptivo-motrices, aptitudes sociales, développement du langage et aptitudes conceptuelles. Myers et Hammill (1976) indiquent aussi six domaines de déficiences : émotivité, activité motrice, perception, symbolisme, attention et mémoire.

Ces interprétations représentent différentes descriptions des trois types principaux de difficultés d'apprentissage mentionnées par Wieberholt (1974). En outre, elles sont conçues pour aider à délimiter les caractéristiques de comportement plutôt que pour servir de point de départ à une classification. Mais si l'on ne connaît pas à fond la terminologie et le cadre théorique complexe à partir duquel ces formulations sont élaborées, elles ouvrent la porte à toutes les interprétations sans pour autant aider à comprendre la classification des difficultés d'apprentissage.

Les pièges à éviter dans la mise au point d'une définition acceptable sont bien connus des spécialistes de la recherche sur les difficultés d'apprentissage. Gearheart (1977) énumère les erreurs les plus fréquentes dans les définitions actuelles :

1. Elles n'indiquent pas le degré de la déficience, ce qui peut contribuer à augmenter sensiblement le pourcentage des enfants en difficulté d'une école donnée. Soulignons toutefois qu'il y a eu récemment plusieurs tentatives pour régler ce problème. Kidd (1971, dans Farrald et Schramber, 1973) postule un modèle tridimensionnel dans lequel chaque dimension constitue un paramètre essentiel à toute tentative de catégorisation, l'une se rapportant à la spécificité -- de très spécifique à relativement général, et une autre à la gravité -- de facilement remédiable à irrémédiable. ADAPT (Farrald et Schramber, 1973) propose un système de classification en cinq points de gravité croissante, dans lequel chaque niveau de gravité s'accompagne de moyens appropriés pour mettre au point des programmes de diagnostics ou de traitements.
2. L'exclusion des enfants culturellement défavorisés peut ouvrir la porte à bien des abus. Selon la façon dont une école

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interprète cette notion, il peut arriver que des enfants culturellement défavorisés qui présentent des difficultés d'apprentissage soient privés des services spéciaux auxquels ils ont droit ou que des enfants défavorisés qui présentent des difficultés d'apprentissage soient privés des services spéciaux auxquels ils ont droit ou que des enfants défavorisés culturellement soient considérés comme des enfants en difficulté.

3. Comme il n'appartient pas à l'éducateur de diagnostiquer une dysfonction du système nerveux central, l'inclusion de ce facteur étiologique dans la définition des difficultés d'apprentissage, loin de faciliter la mise au point de services spéciaux efficaces, risque de l'entraver.
4. Elles ne font aucune distinction entre les problèmes temporaires, symptomatiques et les problèmes plus spécifiques, à long terme.

Outres ces mises en garde, Haring et Bateman (1969) mentionnent d'autres considérations pratiques visant à améliorer les définitions actuelles.

Basic guidelines in the development of educational definitions of children with learning disabilities should establish definitions which encourage 1) facilitation of services for children, 2) breadth for inclusion of all children needing these services, 3) exclusiveness for avoidance of inefficient overlap with other services, 4) flexibility.

Même si l'on reconnaît à quels objectifs devrait répondre une définition, les moyens dont on dispose actuellement ne laissent entrevoir aucune amélioration notable en ce sens. Comme le souligne ADAPT (Farrald et Schramber, 1973), on a tendance à douter de la validité des systèmes actuels de classification, qui reposent sur une définition et une évaluation encore imprécises.

À ce stade de la recherche sur les difficultés d'apprentissage, le niveau de compréhension visé est représenté par les points d'entente fondamentaux que l'on retrouve dans les définitions actuelles. Parmi les éléments communs reconnus par différents auteurs (Gearheart, 1977; Kirk, 1972; Lerner, 1976; Myers et Hammill, 1976), mentionnons les suivants :

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1. Le rôle général d'une dysfonction du système nerveux central.
2. Le principe de la disparité — les déficiences scolaires ou les troubles au niveau des processus sont caractérisés par des écarts entre les individus au niveau des aptitudes ou entre le potentiel d'apprentissage et le rendement.
3. La notion d'exclusion — les difficultés d'apprentissage sont des problèmes spécifiques et ne sont pas reliées à d'autres handicaps (déficience mentale, perturbations affectives, etc.).
4. Le rapport entre la déficience et les processus d'apprentissage — la déficience, le trouble ou la dysfonction — doit se manifester au niveau d'un processus d'apprentissage donné : langage, mémoire, lecture, orthographe, calcul, conception, perception... ou autres aptitudes connexes.
5. Le dépistage doit se faire essentiellement à partir de critères psychoéducatifs.

II. FRÉQUENCE

L'évaluation de la fréquence des difficultés d'apprentissage varie selon la norme employée et le degré d'inclusion ou d'exclusion compris dans la définition : plus la définition est large, plus le pourcentage déclaré est élevé. Après avoir passé en revue vingt-et-une études sur le sujet, Bryant et McLoughlin (1972) ont constaté que la fréquence des difficultés d'apprentissage variait de 3 à 28 pour cent, la moitié des cas se situant au-dessus de 13 pour cent. Parmi une centaine de répondants étudiés par Wissink (1972) et rapportés par Myers et Hammill (1976), la moitié évaluait cette fréquence à cinq pour cent ou moins, et le tiers à quinze pour cent ou plus.

Ces contradictions au niveau des chiffres semblent être en rapport avec l'absence de normes opérationnelles strictes. Si l'on se fonde sur la définition du NACHC (1968), qui met l'accent sur les troubles de la perception à l'exclusion des difficultés d'apprentissage moins graves, la fréquence varie de un à trois pour cent (Perkins, 1976). La Canadian Association for Children with Learning Disabilities (CACLD) indique un pourcentage d'environ 10 pour cent de la population totale, ce qui, selon Underwood (1976), "est plutôt inférieur à la réalité". En outre, alors que de nombreux auteurs mentionnent un pourcentage aussi élevé que trente pour cent, d'autres sont encore plus prudents et tendent vers une évaluation de un pour cent (par exemple, Brenton et Gilmore, 1976; McIntosh et Dunn, 1973; le ministère de l'Éducation de l'Ontario, 1971). Ainsi, comme Senf et Sushinsky (1975) l'indiquent : "Il est toujours possible d'établir une définition opérationnelle des difficultés d'apprentissage à partir de laquelle on peut déterminer le pourcentage de fréquence souhaité, et limiter les services en conséquence".

L'écart entre les différentes opinions des spécialistes relativement à la définition et à la fréquence des difficultés d'apprentissage est illustré par la façon dont Hammill (1976) envisage l'évolution dans ce domaine. Selon lui, il existe actuellement trois grandes façons d'interpréter les choses, c'est-à-dire trois façons de rendre la définition opérationnelle. La première "strictement constructionnaliste" comprend presque uniquement les troubles "graves", c'est-à-dire les troubles cliniques classiques, notamment la dyslexie, la dysphasie et le syndrome de Strauss. La deuxième, beaucoup plus large et plus souple, englobe

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les troubles "moins graves" tels que rendement insuffisant, manque de motivation et pauvreté de l'enseignement. Dans la troisième, les normes d'identification sont plus souples que dans la première, tout en étant plus rigoureuses que dans la deuxième.

La description de la fréquence des difficultés d'apprentissage sera évidemment très différente selon que l'on suit l'une ou l'autre orientation. Les deux positions extrêmes sont bien représentées dans les différents ouvrages sur le sujet, et chacun défend farouchement son point de vue.

En fait, les publications ne nous éclairent guère en matière de fréquence. Mais à partir des recherches effectuées, il est néanmoins possible de réduire prudemment l'éventail des difficultés d'apprentissage.

Par exemple, à partir d'une définition fondée sur l'écart éducationnel qui utilise comme norme un certain quotient d'apprentissage (QA), Myklebust et Boshes (1969) estiment que 7,5 pour cent de la population scolaire présentent des difficultés d'apprentissage. Selon Mercer, Forgnone et Walking (1976), à partir d'une définition opérationnelle vérifiée en Floride, a dépiaté des difficultés d'apprentissage chez 5 pour cent des enfants de la maternelle à la deuxième année.

Les études fondées sur des normes opérationnelles spécifiques de dépistage situent généralement cette fréquence entre 5 et 7,5 pour cent. Soullignons cependant que ces études, qui tentent de prouver l'efficacité de leur instrument de mesure, cherchent sans doute à dépister tous les enfants présentant des symptômes de difficultés d'apprentissage, y compris ceux qui n'auraient besoin que d'un peu d'attention particulière pour suivre une classe régulière.

Aussi, même s'il est impossible d'évaluer exactement la fréquence des difficultés d'apprentissage tant que l'on ne disposera pas de normes de définition plus objectives, il semble que de 5 à 7,5% des enfants présentent des symptômes de difficultés d'apprentissage, alors que de 1 à 3% souffrent de troubles moyens ou graves exigeant des mesures pédagogiques spéciales.

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Malgré l'ambiguïté entourant cette question, les spécialistes s'entendent pour constater que les difficultés d'apprentissage sont plus fréquentes chez les garçons que chez les filles. Yahraes et Prestwich (1976) soulignent que le ratio garçons/filles varie — selon l'étude — de 1,3:1 à 15:1.

La plupart des auteurs (par exemple Kirk et Elkins, 1975; Gruenberg, 1964; Paine, 1968) sont d'avis que les difficultés d'apprentissage touchent environ trois fois plus de garçons que de filles. On a tenté d'expliquer ce phénomène de diverses façons. Selon Passamarick (1959), le système nerveux central des garçons est plus fragile que celui des filles, alors que Yahraes et Prestwich soutiennent qu'il se développe plus lentement. Quelle qu'en soit la cause, la plus grande fréquence chez les garçons est un fait établi, ce qui a amené beaucoup de chercheurs (Emery, 1973; Hirst, 1967; Janaky et de Hirsch, 1972) à conclure qu'il faut établir des mesures de dépistage différentes selon le sexe.

III. ÉLÉMENTS DE DÉFINITION

Comme le soulignent Brenton et Gilmore (1976), lorsqu'on cherche à identifier la population présentant des difficultés d'apprentissage, on se heurte à un problème : traduire en termes quantifiables, à l'intention des spécialistes, des définitions fondées sur des notions théoriques. Pour qu'une définition puisse servir de base à des mesures correctives, il faut que chacun de ses éléments puisse être utilisé dans la pratique par les éducateurs.

Selon Kerlinger (1973), une définition est opérationnelle lorsqu'en attribuant une signification à une notion ou à un concept, elle précise les opérations qu'il faut effectuer pour mesurer cette notion ou ce concept. Pour illustrer les attitudes des spécialistes qui ont tenté de se conformer aux normes de Kerlinger, nous nous proposons d'analyser, de ce point de vue, les éléments que l'on retrouve le plus souvent dans les définitions des ouvrages les plus courants.

Mais auparavant, soulignons que les différentes tentatives de définition des difficultés d'apprentissage utilisent des éléments différents suivant les exigences du diagnostic. Une définition insiste sur l'élément neurologique ou pédagogique, les processus d'apprentissage ou le rendement scolaire, à l'exclusion des autres facteurs, selon que l'auteur considère que les difficultés d'apprentissage proviennent d'une cause neurologique ou d'une dysfonction au niveau des processus d'apprentissage ou que c'est la pauvreté du rendement scolaire qui est importante et que la cause est secondaire. En général, les différentes positions adoptées par les spécialistes dans le dépistage des difficultés d'apprentissage correspondent à une combinaison des six éléments suivants : intelligence, processus d'apprentissage, rendement scolaire, écart entre le rendement et les aptitudes, causes neurologiques et facteurs d'exclusion.

Abandonnant cette hypothèse fondamentale relative aux méthodes actuelles de dépistage et d'évaluation, nous allons maintenant passer à une description générale de la façon dont chaque élément de la définition contribue à l'élaboration du diagnostic. Chacun de ces éléments sera présenté à l'intérieur d'un cadre dans lequel seront analysés les moyens de dépistage et de diagnostic qui ont une valeur opérationnelle. Cet aperçu ne vise pas à offrir

une étude en profondeur des tests et techniques à l'usage des spécialistes mais à amorcer une discussion générale des pratiques en vigueur et à analyser brièvement certaines questions pertinentes.

1. **L'intelligence** -- Cet élément est généralement compris dans les définitions, soit dans l'expression "intelligence moyenne ou supérieure à la moyenne", soit dans l'exclusion de la déficience mentale, pour éviter que certains élèves dont les problèmes d'apprentissage proviennent d'une anomalie mentale ne soient confondus avec ceux qui présentent des difficultés d'apprentissage. Comme l'explique Norman (1977), "la norme qui définit le niveau de fonctionnement de l'intelligence, ou quotient intellectuel (QI), peut être générale ou vague, ou spécifique et définie. La méthode d'évaluation du QI peut être descriptive ou opérationnelle, selon que l'enfant démontre une intelligence "appropriée", ou "normale", ou a obtenu un QI de 90 ou plus au cours d'un test individuel". Mais pour qu'une définition serve au dépistage des difficultés d'apprentissage, les normes relatives à l'intelligence doivent être accompagnées de critères opérationnels spécifiques. En d'autres termes, elle doit indiquer un niveau d'intelligence au-dessus duquel il soit possible d'accepter un diagnostic de difficultés d'apprentissage et recommander un test standard qui permette de déterminer cette mesure d'intelligence.

Les évaluations contradictoires de la fréquence des difficultés d'apprentissage proviennent surtout des problèmes posés par la notion d'intelligence. Mentionnons d'abord les divergences d'opinions concernant les tests qui mesurent le plus exactement l'intelligence. Selon Gearheart (1977), trois grands tests servent habituellement à mesurer le quotient intellectuel -- l'un des trois tests ou échelles de Wechsler (l'échelle WPPSI pour les enfants d'âge préscolaire et de niveau élémentaire, l'échelle WISC pour les enfants et l'échelle WAIS pour les adultes), le test Stanford-Binet, et le test ITPA sur les aptitudes psycholinguistiques. Dans une étude sur les caractéristiques des enfants inscrits dans les Child Service Demonstration Centers (CSDC) aux États-Unis, Norman (1977) indique que quatre tests ont servi à déterminer le QI -- l'échelle de Wechsler, les tests de Binet et de Slossen, et le test de vocabulaire de Peabody (PPVT). Comme les résultats de ces quatre tests sont différents et que le QI considéré comme synonyme d'intelligence normale varie d'un auteur à l'autre, il est impossible de définir la notion d'intelligence de manière opérationnelle et d'en

faire une référence universelle. Norman, par exemple, a constaté que les scores moyens de ces quatre tests étaient respectivement de 91,5 97,7, 98,5 et 99,9, et qu'il y avait une différence notable entre le QI mesuré par le test verbal (VG-89,6) et le test de rendement (PQ-95,4) et de WISC. Cette dernière constatation, confirmée par d'autres auteurs (Rudel et Denckla, 1976; Rourke et coll., 1973), a amené l'auteur à conclure que le QI mesuré par le test de rendement donne une meilleure idée de l'intelligence que le test verbal, et que les scores obtenus aux tests de Wechsler ne peuvent servir de normes opérationnelles. Le score de 90 de Hammill (1976), "autant pour le test verbal que pour le test de rendement", pourrait donc servir à appuyer deux évaluations très différentes de la fréquence des difficultés d'apprentissage. En outre, une comparaison entre les normes de Hammill et celles qu'emploient Ashlock et Dolan (1976) dans leur définition opérationnelle -- et un QI d'au moins 80 à un test comme celui de Wechsler -- entraînerait un écart encore plus considérable dans le nombre de cas dépistés.

Malgré une certaine contradiction au niveau de l'interprétation, les spécialistes considèrent qu'une intelligence normale ou au-dessus de la moyenne est essentielle au diagnostic de difficultés d'apprentissage. Certains auteurs se sont récemment inquiétés de l'usage abusif qui est fait de l'intelligence comme critère de sélection si bien qu'il arrive souvent que des enfants d'intelligence inférieure à la normale soient acceptés dans des programmes conçus pour des enfants en difficulté d'apprentissage. Dans une autre étude des CSDC, Kirk et Elkins (1975), constatant que les enfants inscrits dans ces centres avaient un QI inférieur à celui de la population normale, ont conclu qu'un trop grand nombre d'enfants considérés comme ayant des difficultés d'apprentissage sont en réalité des enfants lents. De la même façon, Norman (1977) recommande "d'approfondir l'usage du "QI" le plus élevé possible comme critère de l'intelligence normale".

Norman (1977) souligne en outre d'autres facteurs qui doivent entrer en considération dans une définition opérationnelle de l'intelligence. Les résultats de son étude indiquent que le QI est influencé par l'âge (il diminue avec l'âge), l'origine ethnique (les Noirs ont des résultats inférieurs à ceux des Blancs) et le milieu (les élèves des milieux urbains ont des résultats inférieurs à ceux des banlieues ou des milieux ruraux). Bien qu'il faille tenir compte des

préjugés culturels inhérents aux tests d'intelligence standard et des abus auxquels ils peuvent donner lieu nous n'en parlerons pas ici, la documentation étant importante sur le sujet.

Enfin, comme le soulignent de nombreux ouvrages sur le sujet, bien que l'utilisation de critères spécifiques en matière d'intelligence soit essentielle à l'orientation du processus diagnostique, les caractéristiques uniques de chaque enfant exigent que l'on fasse preuve d'une certaine souplesse dans la pratique. Par exemple, l'on ne refusera pas l'accès aux programmes spéciaux à un enfant dont le QI se situe à la limite de l'intelligence normale, mais qui répond par ailleurs à toutes les éléments d'un diagnostic de difficultés d'apprentissage.

2. Les processus d'apprentissage -- Les processus d'apprentissage, qui représentent le théâtre principal des déficiences qui entraînent des difficultés d'apprentissage, sont présentés dans les définitions de différentes manières. Pour le NACHC (1968), ce sont "les processus psychologiques fondamentaux entrant dans la compréhension ou l'expression orale ou écrite". Dans leur définition des principales difficultés d'apprentissage spécifiques McIntosh et Dunn (1973) parlent des "processus d'apprentissage spécifiques, fondamentaux, faisant appel à la perception, la conception ou l'expression, au langage parlé et écrit ou aux mathématiques."

Même s'il s'agit d'un domaine plutôt vague, la notion de déficience au niveau des processus d'apprentissage est un élément important de la plupart des définitions. Ceux qui préfèrent définir les difficultés d'apprentissage en termes de déficiences des processus admettent généralement l'existence d'un rapport entre les difficultés scolaires et une dysfonction sous-jacente au niveau de la perception, de l'intégration ou de l'expression (Bateman, 1967). Toutefois, même si l'accent est mis sur trois domaines principaux - la perception, la motricité et le langage -- les opinions varient considérablement en ce qui a trait aux activités mixtes entrant dans ces processus fondamentaux. Les différentes interprétations des domaines de déficiences varient selon l'orientation théorique de leurs auteurs.

Pour Frostig (1964), par exemple, qui met l'accent sur la perception visuelle, les difficultés d'apprentissage reflètent une déficience au niveau d'une

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de cinq aptitudes spécifiques -- coordination oeil-main, perception figure-fond, constance de forme, perception de la position dans l'espace, relations spatiales. En vue de déterminer le domaine d'apprentissage affecté, il a mis au point un test de perception visuelle (le test DTVP, Frostig et coll., 1964) qui mesure les déficiences dans chacun des cinq domaines.

Parallèlement, Kirk (1972), qui considère que certaines aptitudes psychologiques et linguistiques sont essentielles au rendement scolaire, a mis au point une batterie de 12 tests (les tests ITPA, Kirk et McCarthy, 1968) pour déterminer les déficiences psycholinguistiques spécifiques pouvant entraîner des difficultés d'apprentissage.

D'autres auteurs tels que Sabatino et Foster (1974, 1976), Chalfant et Schefflin (1969), Minskoff, Wiseman et Minskoof (1972) et Mylkebus (1968), ont formulé différentes hypothèses relativement aux processus en rapport avec les difficultés d'apprentissage et proposé des moyens diagnostiques pour en déterminer la cause. Selon Myers et Hammill (1976),

"It is doubtful whether authorities in the field could ever agree on their (psychological process) existence, identification, nature, or importance. To some professionals, these processes involve such factors as memory closure, and feedback. To others, they are the psycholinguistic dimensions... To others, these are the skills that comprise particular abilities... To yet another group, they imply the transmission functions."

En raison de la nature imprécise de la notion de déficience au niveau des processus d'apprentissage, il est donc particulièrement difficile de s'en servir pour dépister les difficultés d'apprentissage. Dans le même ordre d'idée, beaucoup de tests utilisés pour obtenir les données nécessaires à l'établissement de normes opérationnelles sont moins bien standardisés, comme mesures normatives, que les tests habituels de rendement (Haring et Bateman, 1969). Ils ont été sérieusement remis en question au cours des dernières années (Hammill et Weiderholt, 1973; Simensen et Sutherland, 1974; Thorndike, 1973). Les adversaires de cette conception contestent surtout l'existence présumée d'un rapport entre les fonctions de la perception et certaines aptitudes scolaires (Larsen et Hammill, 1975; Silverman et O'Bryan, 1974) et la validité des tests de

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perception qui ne permettent pas de mettre à jour les déficiences des processus de perception dans les domaines qu'ils prétendent évaluer (Newcomer et coll., 1975). Larsen et coll., (1976) traite du problème du dépistage des déficiences au niveau des processus d'apprentissage, dans une étude intitulée "The Use of Selected Perceptual Tests in Differentiating Between Normal and Learning Disabled Children". Il souligne que sur les cinq tests de perception habituellement employés (test de Bender sur la perception visuo-motrice, tests de Wepman sur la discrimination auditive et la mémoire visuelle séquentielle, tests ITPA sur la mémoire et la perception auditives), seul le test de Bender a permis de différencier de façon significative les enfants normaux des enfants présentant des difficultés d'apprentissage.

Devant des conclusions aussi convaincantes, la notion de processus d'apprentissage continue d'être l'un des éléments les plus importants des définitions actuelles (Li, 1977) dont 83% l'incluent (Vaughan et Hodges, 1973). Aussi, même si les spécialistes reconnaissent les limites des tests sur lesquels ils s'appuient et en interprètent les résultats avec prudence, ils doivent néanmoins accepter qu'il s'agit là d'un des rares moyens dont ils disposent pour quantifier, même de manière imparfaite, les déficiences au niveau des processus d'apprentissage.

Dans la pratique, les normes indiquées permettent aux diagnosticiens de faire une évaluation plus rigoureuse. Les normes opérationnelles comprises dans la composante d'intelligence servent de guide pour l'évaluation des aspects globaux de l'intelligence, habituellement aux fins de classification et de catégorisation. Aussi, à ce stade du diagnostic, les indications préliminaires de déficiences fournies par les tests d'intelligence servent de point de départ à l'analyse du comportement dans un domaine d'aptitudes spécifique (Lerner, 1976). Selon le processus utilisé, certains tests, sous-tests ou batteries de tests diagnostiques permettent de renseigner sur les aptitudes mentales spécifiques.

Le fonctionnement visuo-moteur, par exemple, peut être évalué à l'aide des sous-tests ITPA sur le décodage visuel, l'association visuo-motrice, le codage moteur, l'ordre séquentiel visuo-moteur; du test du bonhomme, du test de mémoire visuelle, des tests de rétention visuelle de Benton, d'intégration

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visuomotrice de Beery Buktonica, d'aptitudes perceptivo-motrices de Purdue, etc. (Haring et Bateman, 1969).

Ce n'est là qu'un exemple de tests permettant d'évaluer une dysfonction possible dans un domaine particulier. Quelle que soit l'importance accordée aux déficiences des processus dans la définition ou le processus qui intéresse le diagnosticien, on peut trouver une classification correspondante des tests appropriés dans les différents ouvrages sur le sujet.

Reconnaissant que "les mesures existantes reposent souvent sur un échantillonnage normatif insatisfaisant, des techniques administratives non standardisées et un fondement théorique imprécis", Sabatino et Foster (1974) ont mis au point deux instruments standard de mesure de la perception : un test de perception auditive, qui évalue trois domaines de perception auditive, et un test de discrimination et de mémoire visuelles (le test VPDM), qui évalue les aptitudes en matière de perception et de mémoire visuelle. À l'aide de ces deux tests et de celui de Bender sur les aptitudes visuo-motrices (le test BVMGT) comme mesure du développement visuo-moteur, Sabatino et Foster recommandent une technique qui permette de rendre opérationnelle la composante de processus d'apprentissage. Ils suggèrent que les données fournies par ces tests soient traduites en résultats standard, de sorte qu'il faille une déviation standard de moins un (-1 SD) pour diagnostiquer des troubles de la perception. Les enfants dont le score est inférieur à ce point de démarcation (qui équivaut à peu près au 16^e centile d'une distribution normale) seraient admissibles à des programmes spéciaux.

Les exemples de définitions opérationnelles exigeant des tests spécifiques d'analyse des processus sont plutôt rares. Cette notion est plutôt traduite en termes opérationnels qui ont uniquement une valeur d'orientation en matière de diagnostic. En général, des normes standard sont exigées pour tous les processus, quelle que soit la façon dont ils sont mesurés. Dans sa définition opérationnelle, l'État de la Floride, par exemple (U.S. Office of Education, 1976), inclut la notion de processus suivante :

"Evidence of a disorder in one or more of the basic psychological processes: Based on a student's expected level of functioning (EA - 2MA - CA/3), a score of less than -2 SDs in one process area, or a

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score of less than 1 1/2 SDs in three or more process areas. Process areas are defined as: 1. visual channel processes, 2. auditory channel processes, 5. sensory integrated processes".

Dans les cas où l'on ne dispose pas de chiffres sur la déviation standard, on peut appliquer la norme suivante : pour un processus particulier, un score inférieur à 70% du niveau de fonctionnement attendu; pour trois processus ou plus, un rendement inférieur à 80%.

Quels que soient le domaine analysé ou les moyens employés pour évaluer une dysfonction au niveau d'un processus d'apprentissage, l'évaluation est l'une des étapes les plus importantes dans la pratique, car c'est elle qui détermine le choix des mesures correctives. La notion de déficiences au niveau d'un processus particulier repose sur l'hypothèse qu'un enfant souffrant d'une dysfonction à ce niveau aura de la difficulté à faire un travail exigeant le recours à ce processus (Chalfant et King, 1976). Selon cette théorie, il faut donc connaître les déficiences au niveau des processus pour mettre au point des mesures pédagogiques efficaces.

Comme l'indiquent Goodman et Mann (1976), "le domaine des difficultés d'apprentissage repose sur l'hypothèse de l'existence de déficiences spécifiques au niveau des processus d'apprentissage". Malgré cela, ceux qui font entrer cette notion dans la définition des difficultés d'apprentissage ont peu de moyens de l'exprimer de façon opérationnelle. Ils doivent plutôt se fier aux moyens de ceux qui ont mis au point des tests sur les processus d'apprentissage (par exemple, Kephart, 1971; Kirk, 1972; Frostig, 1964; Sabatino et Foster, 1974). Même en admettant que ces tests mesurent exactement les déficiences spécifiques des processus d'apprentissage, il n'en demeure pas moins que le degré de faiblesse du processus d'apprentissage qualifié de "déficiency" est fixé arbitrairement. Ces tests ne précisent pas, par exemple, à quel moment finit la fonction et commence la dysfonction de la perception.

Selon Goodman et Mann (1976), le problème vient de ce que, contrairement aux déficiences scolaires qui se manifestent directement dans le rendement scolaire, il faut recourir aux tests pour déceler les déficiences au niveau des processus d'apprentissage. Ils proposent donc de se servir des tests

sur les processus d'apprentissage tels que les tests ITPA et DTVP, et de tests plus généraux comme ceux de Wechsler et de Binet, pour évaluer la faculté cognitive plutôt que le processus, et d'en interpréter les résultats pour déterminer le niveau de dysfonction spécifique indiquant les domaines de dysfonction cognitive, sans tenter de déterminer le ou les processus en jeu.

Enfin, certaines questions relatives à l'évaluation des processus d'apprentissage sont mieux analysées dans le contexte de leurs relations avec le rendement scolaire et l'écart entre ce dernier et le potentiel d'apprentissage. Pour certains auteurs, par exemple, les déficiences scolaires expliquent mieux les difficultés d'apprentissage que les déficiences au niveau des processus, alors que pour d'autres, ces deux éléments sont inséparables. Dans les deux cas, la notion d'écart entre le rendement et les aptitudes est couramment employée pour passer du diagnostic à la pratique.

3. **Le rendement scolaire** -- Le rendement scolaire fait partie de la définition des difficultés d'apprentissage pour souligner l'importance de cette notion dans le processus d'apprentissage. Bien des définitions, qui mettent surtout l'accent sur les déficiences au niveau des processus, mentionnent aussi le rendement scolaire, soulignant que pour être classées comme causant des difficultés d'apprentissage, les déficiences au niveau des processus doivent se traduire par des déficiences scolaires. Selon la définition du NACHC (1968), "ces déficiences peuvent se traduire par des difficultés de... lecture, d'écriture, d'orthographe, de calcul". Le Council for Exceptional Children (CEC, Barsch, 1967) parle de "déficiences spécifiques dans les processus de perception, d'intégration ou d'expression qui nuisent considérablement à l'apprentissage". Kass et Myklebust (1969) définissent les difficultés d'apprentissage comme "des déficiences importantes au niveau des processus d'apprentissage essentiels... notamment la perception, l'intégration et l'expression".

Ces définitions englobent généralement la notion de rendement scolaire pour souligner le rapport fortuit entre les déficiences au niveau des processus et les difficultés d'apprentissage. Cette notion sert alors à souligner à des fins opérationnelles les renseignements et les mesures d'ordre pédagogique nécessaires à la découverte des fonctions scolaires perturbées par les dysfonctions découvertes au niveau des processus ou au contraire, des processus ayant

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entraîné les déficiences scolaires découvertes. Par exemple, un enfant peut obtenir des résultats médiocres aux tests de lecture et aux tests de perception auditive ou de mémoire visuelle (Bateman, 1967).

Pour Sabatino et Foster (1976), qui font appel aux notions de rendement scolaire et de processus d'apprentissage dans leur définition, pour que l'on diagnostique une déficience scolaire, il faut qu'un enfant présentant une déficience au niveau des processus d'apprentissage remplisse en outre une autre condition : être incapable de réussir au-delà du 20^e centile les tests standard de rendement dans une matière donnée.

Mais bien des auteurs (par exemple, Hammill, 1976; Li, 1977; Valett, 1969; Vellutino et Tanzman, 1977) demeurent inflexibles : et n'acceptent de définir les difficultés d'apprentissage que du point de vue des déficiences scolaires. Ils rejettent la notion selon laquelle les difficultés d'apprentissage sont des déficiences au niveau des processus, et les définitions qui font appel aux causes de ces difficultés. Selon eux, l'évaluation ne doit pas aller au-delà des problèmes pédagogiques connexes observables.

Il existe une foule d'exemples de définitions axées sur la description des déficiences scolaires. Pour Valett (1969), par exemple, "toute difficulté spécifique dans l'acquisition ou l'usage de l'information ou des aptitudes essentielles à la solution d'un problème" constituent autant de difficultés d'apprentissage. Quant à Farrald et Schramber (1973), l'enfant en difficulté d'apprentissage est celui qui, "pour une raison quelconque, ne parvient pas à atteindre les objectifs du programme scolaire". Selon Rosner (1975), "un enfant présente une difficulté d'apprentissage quelconque lorsque l'insuffisance de son rendement scolaire ne peut être expliquée par une déficience mentale, une perturbation affective ou un manque de motivation".

Les définitions qui mettent l'accent sur la notion de déficience scolaire varient selon les mesures utilisées comme indices des aptitudes scolaires. Les résultats des différents tests : rendement, résultats dans les matières scolaires de base, aptitudes scolaires spécifiques, réactivité ou intelligence générale, expriment de façon normative l'âge mental, l'âge chronologique, le rendement attendu, le niveau scolaire ou le QI. Pour Hammill (1976), la

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notion de rendement scolaire est définie à partir des résultats des tests de maturité, de langage ou de rendement, selon le niveau scolaire de l'enfant :

1. Rendement des enfants d'âge préscolaire ou de maternelle aux tests de réactivité ou de langage : déviation standard de -1,5.
2. Rendement des élèves de 1^{re} et 2^e années aux tests d'aptitudes, de langage ou de rendement : déviation standard de -1,5.
3. De la 3^e à la 7^e années : évaluer la classe où devrait être l'enfant, selon son âge chronologique. Diviser par 2. Si le rendement mesuré dans un domaine scolaire est inférieur à ce chiffre, l'enfant peut être admis dans la classe..
4. 8^e année et plus : les élèves doivent réussir les tests de rendement au niveau de 4,5 ou moins.

La notion de rendement scolaire qui sert de base à la définition de l'État de la Floride (U.S. Office of Education, 1976) est fondée sur le rendement attendu de l'élève et les tests d'aptitude dans certaines matières scolaires :

"Evidence of academic deficits. Based on the student's expected level of functioning, a score of 70% EA or below for 3 to 6 years of school attendance; 60% EA or below for 7 to 9 years of school attendance; 50% EA or below for 10 or more years of school attendance, in one or more of the following academic areas : reading, writing, arithmetic, or spelling. For children in grades K-2, evidence must be presented that the student is achieving below his expected level on pre-academic tasks which require listening, thinking, or speaking skills".

En raison de la confusion qui règne au niveau de l'établissement de normes opérationnelles, certains auteurs ont simplement défini les enfants en difficulté d'apprentissage comme les derniers 2% des enfants faibles qui ne sont pas reconnus admissibles à d'autres services spéciaux (McIntosh et Dunn, 1973).

Les moyens et techniques diagnostiques employés pour déterminer si un enfant répond aux normes servant à définir la déficience scolaire sont généralement considérés comme étant plus objectifs et plus fiables que les moyens psychologiques. Selon l'interprétation de la notion de déficience scolaire dans une définition donnée, le diagnosticien peut être contraint (comme

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l'ont indiqué Faas, en 1976 et Haring et Bateman, en 1969) d'administrer des tests de rendement : la batterie de tests de Californie, de Stanford ou du Metropolitan, les tests de rendement Wide Range ou ceux de Peabody; les tests de rendement dans les matières scolaires de base : le test de calcul Keymath ou celui de Stanford; le test d'épellation de Lincoln, le Phonics Knowledge Survey; les tests de lecture de Durrell, Gates, Gray ou Monroe; les tests de réactivité de Brenner ou du Metropolitan et les tests d'aptitudes scolaires de Boehm ou de Vallet.

Ceux qui préconisent une définition des difficultés d'apprentissage en termes de déficience scolaire voient dans les méthodes diagnostiques le moyen de cerner les faiblesses au niveau des matières scolaires et les déficiences au niveau du rendement ou des aptitudes, en vue de mettre en oeuvre des mesures correctives. Ils insistent donc sur l'importance des méthodes d'évaluation non officielles, en plus des tests officiels, pour s'assurer que toute l'information pédagogique pertinente est recueillie. La méthode de "l'observation planifiée du comportement" est l'une de ces techniques selon laquelle une foule de données observables sont soigneusement observées et notées (par exemple les aptitudes motrices dans la façon de se servir d'un crayon et de papier, la réaction au bruit) concernant la façon dont un enfant aborde un problème et essaie de le résoudre (Gearheart, 1977). Au sujet des méthodes d'évaluation non officielles, DeGenaro (1975) présente des suggestions sur la façon dont l'enseignant peut évaluer, par différentes méthodes, la discrimination et la mémoire visuelles, la discrimination et la mémoire auditives, la reconnaissance des lettres, la reproduction séquentielle de l'alphabet, la connaissance des phonèmes, les aptitudes tactiles, les inversions et les rotations, les aptitudes verbales, la copie de près et de loin, la confiance en soi, la coordination visuo-manuelle et le langage écrit, l'aptitude à suivre des directives et la motricité globale.

C'est à l'intérieur de cette catégorie générale de diagnostics que se situe l'orientation axée sur l'analyse de la tâche. Selon Frank (1973), l'analyse de la tâche se fait en quatre étapes : 1) énoncer les objectifs d'apprentissage (ou de comportement); 2) énumérer les éléments ou les aptitudes nécessaires pour atteindre ces objectifs et les placer par ordre séquentiel logique d'enseignement; 3) vérifier de manière non officielle les aptitudes que l'enfant possède

déjà; 4) commencer à enseigner dans l'ordre les aptitudes suivant la hiérarchie établie lors de l'analyse de la tâche.

Pour de nombreux auteurs (Yeasely et Salvia, 1974; Bateman, 1964 et 1967; Engelmann, 1969), cette méthode d'évaluation et de correction des difficultés d'apprentissage est un moyen d'obtenir plus de renseignements diagnostiques et de mener directement à l'enseignement approprié. Ceux qui en recommandent l'emploi prétendent qu'elle a une valeur opérationnelle en ce sens qu'elle organise de façon opérationnelle des tâches définies selon une hiérarchie d'aptitudes séquentielle comme le suggère Bateman (1967), l'analyse de la tâche consiste à "isoler, décrire et ordonner... les tâches que l'enfant doit maîtriser pour atteindre l'objectif fixé".

Mais dans la pratique, la notion d'écart entre le rendement et les aptitudes constitue l'élément essentiel de la déficience scolaire. Les explications ci-après illustreront davantage comment la notion de rendement scolaire se traduit en termes opérationnels.

4. L'écart entre le rendement et les aptitudes -- Cette notion, popularisée par Bateman (1964), est considérée par beaucoup comme le dénominateur commun des difficultés d'apprentissage (Mercer, 1976). Les nombreuses définitions qui mettent l'accent sur l'écart entre le rendement et les aptitudes (Haring et Bateman, 1969; Kass et Myklebust, 1969; McIntosh et Dunn, 1973; Chalfant, dans McDonald, 1968) varient peu dans leur description de ce facteur : l'écart entre le rendement et les aptitudes est le critère fondamental d'identification des difficultés d'apprentissage.

Il semble bien que cette notion, qui n'est apparue dans les définitions qu'au début des années 1960, ait été mise au point pour répondre aux problèmes pratiques de l'heure. L'absence d'indices quantifiables, le manque de formulation pédagogique pertinente et une insatisfaction croissante relativement à l'importance accordée aux facteurs étiologiques dans les définitions, semblent avoir contribué à mettre l'accent sur la notion d'écart.

Une étude des définitions actuelles de cette notion d'écart semble démontrer l'existence de deux types de critères ou de deux stratégies visant à la

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rendre opérationnelle, ce qui correspond globalement à deux grandes conceptions des difficultés d'apprentissage.

Le premier type d'écart est la différence entre l'évaluation des aptitudes ou du potentiel intellectuel de l'enfant et les résultats ou le rendement scolaire. Cette norme est souvent utilisée comme point de départ pour l'application pratique de la notion de déficience scolaire dans les définitions centrées sur l'aspect pédagogique (McCarthy et McCarthy, 1970; Kass et Myklebust, 1969; Kirk, 1972; Cauley, dans McDonald, 1968).

Les mesures diagnostiques d'évaluation de l'écart entre le rendement et les aptitudes comparent les aptitudes scolaires mesurées dans des tests standard de rendement ou d'intelligence (par exemple, le test de Binet ou l'échelle de Wechsler), avec les aptitudes scolaires évaluées à partir de certaines variables telles que l'âge mental (déterminé par les tests d'intelligence), le rendement en classe (déterminé par des tests de rendement), le rendement attendu, l'âge chronologique ou le niveau scolaire (McCarthy & McCarthy, 1970).

La notion de quotient d'apprentissage (QA), mise au point par Myklebust (1968) comme indice de l'écart entre le rendement attendu et le rendement fourni, permet de quantifier le QA par rapport à trois facteurs : l'âge mental (AM), l'âge chronologique (AC), et le groupe d'âge de la classe (GA). Selon Myklebust, le QA est donc le ratio entre le rendement fourni (RF) et le rendement attendu (RA) : $QA = RF/RA$ alors que $RA = AM - AC - GA/3$. Il faut un QA de 89 ou moins pour établir un diagnostic de difficultés d'apprentissage.

Parmi les autres formules d'évaluation de l'écart entre le rendement et les aptitudes, mentionnons celle de Harris (1970) sur le niveau mental (NAL : niveau attendu de lecture = $AM - 5$), celle de Bond et Tinker (1967) sur le nombre d'années passées à l'école (NAL : nombre d'années à l'école $\times QI/100 - 1,0$) et celle de King (1976) sur le niveau d'écart sérieux (NES = $AC (QI/300 - 1,7 - 25)$).

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Mentionnons en outre parmi les techniques recommandées le calcul des indices d'écart (Woodbury, 1963) et le calcul de l'écart par le score-Z (Erickson, 1975).

Il existe de nombreux problèmes relativement à l'utilisation des mesures d'écart, en raison de la difficulté qu'il y a à obtenir des données quantitatives fiables sur les aptitudes scolaires ou intellectuelles, notion qui repose sur l'hypothèse que ces aptitudes sont mesurables. Outre le fait que la notion même de QI reste controversée, la question du "potentiel" est loin d'être claire (Salvia et coll., 1974). De nombreux auteurs (par exemple, Hammill, 1976; Norman, 1977; Sabatino, 1976) prétendent que l'échelle WISC de mesure du QI ne renseigne pas sur les forces et les faiblesses des enfants en difficulté d'apprentissage et qu'elle ne devrait pas servir de mesure du potentiel intellectuel. En outre, le recours à l'âge mental, qui était le moyen le plus conventionnel pour déterminer le potentiel intellectuel (Norman, 1977), a été fortement critiqué pour cette raison (Hammill, 1976). Comme le dit Lerner (1976), "peut-on s'attendre à ce qu'un enfant de 9 ans ayant un AM de 13 ans agisse comme un enfant de 13 ans?"

Sans compter le problème qu'entraîne l'établissement arbitraire d'un niveau d'écart qui évalue le plus exactement possible une différence "significative" entre les aptitudes et le rendement. En d'autres termes, à quel moment l'écart devient-il significatif? Certains auteurs (Bryant, 1972; Larsen, 1976) ont suggéré qu'il n'était nécessaire que de classer les cas graves. Reconnaisant ce problème, le gouvernement fédéral des États-Unis a adopté en 1976 le niveau d'écart grave de King (1976) comme formule d'identification des difficultés d'apprentissage. Ce critère, qui fixait arbitrairement le point de démarcation à 50%, a été abandonné par la suite en raison des nombreuses critiques de l'emploi d'une formule unique pour les enfants de tous âges, et sur son inexactitude psychométrique et statistique (Federal Register, 1977). Une étude du niveau d'écart de King (1976) et de la formule de Zigmond (1976) pour le calcul de l'efficacité de l'apprentissage (EA : ce calcul compare le rendement scolaire avec le potentiel attendu, selon l'âge mental; les résultats sont présentés en pourcentage), qui fixe respectivement à 50% et à 60% les points de démarcation, a démontré que le rapport négatif entre l'âge et l'efficacité de l'apprentissage et entre l'âge et le niveau d'écart était tel que seuls les jeunes enfants

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présentant des difficultés d'apprentissage peu importantes étaient inscrits aux programmes spéciaux, alors que des exigences plus sévères étaient fixées pour les enfants plus âgés.

Des chercheurs ont tenté d'éviter la difficulté que pose la quantification du niveau d'aptitudes en employant des méthodes n'exigeant pas le calcul de l'âge mental ni celui du rendement attendu. Pour Rice (1970), par exemple, il existe un "écart significatif" lorsque les résultats du test standard de rendement WRAT sont inférieurs de 15 points ou plus à ceux du QI mesuré par l'échelle WISC. Parmi les autres façons de quantifier l'écart entre le rendement et les aptitudes, mentionnons la formule de Kline (sans date) qui fournit un indice numérique de troubles de lecture. Son quotient de dyslexie (QD) "est conçu pour quantifier les troubles de lecture indépendamment de l'âge, de la classe ou du milieu". Pour calculer le QD, on détermine la différence entre le rendement en lecture (tel qu'exprimé par les résultats des tests d'équivalence en lecture de l'Iowa) et la classe fréquentée. La différence est exprimée en valeur positive ou négative selon que les résultats sont supérieurs ou inférieurs à ceux de la classe. Un QD de zéro indique que le rendement de l'enfant est exactement celui de sa classe. Un QD supérieur à zéro indique que son rendement est supérieur à celui de sa classe et un QD inférieur indique une déficience.

Goodman et Mann (1976) suggèrent de définir l'écart scolaire de la manière suivante : "Dans les aptitudes de base pour le calcul et le langage, un retard de deux ans par rapport à la classe; dans tous les cas, un rendement inférieur à celui de la 7^e année." Pour répondre à cette norme, la différence entre le placement d'un enfant dans une classe et son rendement en lecture ou en calcul doit être de plus de deux ans, et la différence entre cet écart et la classe fréquentée doit être de plus de six ans. Malgré une foule d'objections qui ont été soulevées quant à la rigueur (Thompson, 1970) ou la souplesse (Weiderholt, 1975) de ce retard de deux ans, Goodman et Mann soutiennent que leur formule permet d'éviter les problèmes de l'évaluation du potentiel, tout en tenant compte de l'âge.

Ces différences d'interprétation ne sont sûrement pas étrangères aux évaluations contradictoires de la fréquence des difficultés d'apprentissage.

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En effet, non seulement les auteurs emploient des méthodes de calcul sensiblement différentes, mais ils ne s'entendent guère sur le degré de rigueur ou de souplesse dont elles devraient faire preuve. C'est ainsi, par exemple, que Macy et coll., (1976) accepte le QA de Myklebust comme mesure de l'écart, tout en refusant par ailleurs son point de démarcation unique. Il recommande plutôt des points de démarcation variables selon les différents sous-groupes de classes, sexes et matières scolaires.

Toutefois, même une légère modification des points de démarcation peut influencer considérablement sur le nombre de cas identifiés. Ce phénomène a été démontré par Myklebust et Boshes (1969), qui ont constaté qu'avec un QA de 90 fixé comme point de démarcation, 15% des élèves d'une école publique importante présentaient des difficultés d'apprentissage contre quelque 7% seulement lorsque le QA était ramené à 85.

Malgré ses faiblesses, la notion d'écart est souvent employée pour rendre opérationnelle la notion de déficience scolaire. Dans la définition de l'État du Wisconsin (U.S. Office of Education, 1976), l'écart entre les aptitudes et la classe fréquentée est le critère fondamental des "troubles de lecture importants" tels que mesurés par les tests de reconnaissance des mots ou d'aptitude générale à la lecture. C'est aussi une bonne illustration de la façon dont l'écart est traduit en mesures des déficiences scolaires. Cette définition comprend les trois critères de rendement scolaire suivants :

1. L'élève qui est dépisté pour la première fois doit présenter un écart de rendement important dans deux ou plusieurs domaines de réactivité ou d'aptitudes de base en calcul, épellation et écriture, sans oublier, au niveau élémentaire, cinq aptitudes motrices. L'importance des écarts est déterminée à partir d'une combinaison de tests officiels et non officiels, individualisés, de mesures calculées à partir de critères donnés et d'une analyse des attentes de la classe relativement aux aptitudes de base.
2. Il doit exister un écart entre le placement de l'élève dans une classe et son rendement par rapport à celui du groupe de référence.

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3. Des degrés approximatifs d'écart de rendement ont été fixés par classe (par exemple, la maternelle, la 1^{re} et la 2^e années correspondent au niveau de fonctionnement de 3 ans ou moins, M,0 ou moins respectivement, etc. jusqu'à la 12^e année et un niveau de fonctionnement de 5,0 ou moins). Le nombre d'années passées à l'école entre aussi en ligne de compte.

Le deuxième type d'écart utilisé à des fins pratiques est caractérisé par les différences de rendement individuelles. Cet indice d'écart, qui ne fait pas nécessairement appel à la notion de "potentiel", pose moins de problèmes, mais il apparaît moins souvent dans les définitions opérationnelles. Cela peut être attribuable en partie à la relation étroite existant entre les deux types d'écarts qui représentent des façons différentes d'atteindre les mêmes résultats. La mesure de l'écart entre les aptitudes mentales et les résultats des tests fournit la même information diagnostique fondamentale que le calcul de l'écart entre le rendement et le potentiel pour chacun de ces tests. Dans les deux cas, un écart important indique que le rendement n'est pas proportionnel aux aptitudes.

La notion de différences individuelles dans le rendement ou les aptitudes mentales est acceptée comme critère de mesure des difficultés d'apprentissage et permet d'appliquer les notions de déficiences au niveau des processus d'apprentissage et de déficiences scolaires. Cela découle du profil de développement inégal ou du développement irrégulier des aptitudes mentales que l'on observe chez les enfants en difficulté d'apprentissage. Une analyse de certains éléments du fonctionnement mental révèle souvent que les enfants en difficulté d'apprentissage ne se développent pas de manière uniforme et régulière. Certains de ces éléments sont très forts, d'autres très faibles. Ces forces et ces faiblesses sont donc considérées comme étant caractéristiques des difficultés d'apprentissage, ce qui donne une importance accrue à la notion d'écart (Kirk et coll., (1978); Lerner, 1976).

En résumé, la stratégie propre à ce type d'écart consiste à analyser les résultats des tests secondaires pour déterminer le profil de diagnostic qu'ils peuvent révéler. Selon qu'une définition donnée s'inspire fondamentalement d'une orientation diagnostique ou pédagogique, les résultats des tests secon-

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dares de rendement, ceux des tests portant sur les processus d'apprentissage ou les aptitudes secondaires permettent de mesurer les aptitudes ou le rendement scolaires, à l'aide de moyens appropriés et de les comparer pour déterminer, le cas échéant, toute différence symptomatique.

Même si les forces et les faiblesses individuelles peuvent être rapidement identifiées par de nombreuses mesures du rendement, il existe une foule de renseignements qui fournissent aux diagnosticiens un cadre de références pour l'interprétation des résultats de l'échelle Wechsler et du test ITPA.

Selon Clements et coll., (1964), il se dégage trois profils de rendement parmi les enfants en difficulté d'apprentissage soumis à l'échelle Wechsler.

Pour sa part, Bannatyne (1968, 1974) recommande d'analyser les résultats de l'échelle Wechsler en regroupant les questions en quatre catégories: aptitudes spatiales (images à compléter, dessins avec des cubes, assemblage d'objets), aptitudes à la conceptualisation verbale (compréhension, comparaisons, vocabulaire), aptitudes séquentielles (ordre séquentiel des nombres, calcul, codage) et savoir acquis (information, calcul, vocabulaire). Cette méthode permet de comparer le rendement de l'enfant dans chacune des catégories et fournit au diagnosticien des renseignements fiables sur ses points forts et ses faiblesses. Bien des chercheurs ont critiqué les interprétations des profils de l'échelle Wechsler (par exemple, Ackerman, Peters et Dykeman, 1971; Anastasi, 1968; Glasser et Zimmerman, 1967), mais Rugel (1974), qui a analysé les résultats de 25 enfants en difficulté soumis à ce test, conclut au bien-fondé de la méthode de Bannatyne.

Kirk et coll., (1968) définit la notion d'écart comme une déviation standard de 1 et plus entre les résultats du test ITPA et les résultats moyens d'un enfant. On a beaucoup parlé du test ITPA comme instrument de mesure possible des écarts. Kirk et Kirk (1971) ont fourni un cadre de références pour déterminer à quel moment un écart devient important et expliquer comment évaluer l'importance des écarts entre les résultats d'un test en particulier et ceux d'une combinaison de tests. Paraskevopoulos et Kirk (1969) ont présenté une analyse encore plus détaillée des caractéristiques statistiques du test ITPA

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et expliqué les méthodes de comparaison entre les différences individuelles. En général, les différences sont importantes quand les marges d'erreur ne se chevauchent pas.

Des moyens officiels d'évaluation sont aussi employés pour établir les écarts entre les différentes aptitudes d'un enfant. Parmi ces moyens, mentionnons les tests maison, l'observation du comportement, en matière d'apprentissage, l'orthopédagogie, l'analyse des erreurs des réponses orales et écrites et autres techniques spéciales non officielles (Kirk et coll., (1978) au moyen desquelles l'enseignant ou le diagnosticien peuvent évaluer les écarts. Chalfant et King (1976) suggèrent de recourir au jugement de différents éducateurs pour confirmer ou infirmer les résultats des tests standard. Cela nécessite l'observation attentive des gestes quotidiens qui renseignent sur le comportement et permettent d'identifier clairement les écarts entre le rendement et les aptitudes. Un éducateur attentif, qui connaît bien les critères de diagnostic des difficultés d'apprentissage, peut reconnaître qu'un enfant qui parle bien mais qui est incapable de lire, peut avoir besoin de services d'éducation spéciaux.

5. **Dysfonction neurologique** — Cette notion est comprise dans les définitions qui admettent l'influence du système nerveux central dans le développement des difficultés d'apprentissage.

Certains auteurs sont convaincus qu'il existe une relation directe entre les difficultés d'apprentissage observées et une dysfonction neurologique sous-jacente, ce qui, à leurs yeux, justifierait la mention de cet élément dans la définition des difficultés d'apprentissage (Barsch, 1967; Getman, 1968; Johnson et Myklebust, 1967; Kephart, 1971; Wepman et coll., 1975). Le Tennessee (U.S. Office of Education, 1976), par exemple, définit les difficultés d'apprentissage comme une "dysfonction" dans les processus neurologiques fondamentaux". Cruickshank (1977) soutient qu'une difficulté d'apprentissage spécifiquement définie est la manifestation d'une déficience au niveau des processus de perception, découlant d'une déviation du système nerveux central. Il considère donc comme erronées les définitions qui ne tiennent pas compte de la notion de processus de perception ou de celle d'un forçement neurologique (Li, 1977) aux difficultés d'apprentissage.

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Bien que cette notion figure dans bien des définitions, il n'existe aucune norme stricte permettant d'identifier les difficultés d'apprentissage à partir de leur étiologie, ce qui pourrait avoir des conséquences au niveau de l'application pratique. Elle demeure donc vague et sujette à toutes les interprétations. Il existe peu de recommandations applicables dans la pratique si bien que nous ne nous étendrons pas sur le sujet, nous limitant aux aspects de la recherche neurologique les plus pertinents du point de vue diagnostique.

La recherche neurologique actuelle a été influencée notamment par les travaux de Strauss et Lehtinen (1947), Strauss et Kephart (1955) et certains autres, au cours de la période que Wiederholt (1974) a appelée l'étape de la fondation, durant laquelle la nature et les causes des difficultés d'apprentissage spécifiques étaient le centre d'intérêt. Comme le soulignent Hallahan et Cruickshank (1973), les découvertes de Strauss et de ses collègues "sont devenues un élément intrinsèque des principes fondamentaux sur lesquels s'est édifié le domaine de la recherche sur les difficultés d'apprentissage".

Observant des similitudes de comportement chez les retardés exogènes et les personnes présentant une lésion cérébrale, Strauss a remarqué en outre des symptômes de lésion cérébrale chez les enfants souffrant de troubles psychologiques et d'ordre conceptuel, "indépendamment de leur situation sur l'échelle Binet" (Strauss et Lehtinen, 1947).

Il s'est servi de la notion de lésion cérébrale pour expliquer les symptômes des enfants présentant des troubles au niveau de la réflexion, du comportement et de la perception, tout en admettant que ce syndrome était étranger au problème global de la déficience mentale.

Par la suite, Stevens et Birch (1957) ont proposé l'expression "syndrome de Strauss" pour décrire l'enfant souffrant d'un désordre du système nerveux central et qui présente les symptômes suivants : 1) comportement instable, 2) hyperactivité, 3) organisation médiocre du comportement, 4) distraction élevée, 5) persistance des erreurs de perception.

Ainsi, à la suite des travaux de Strauss, des manifestations de comportements caractéristiques d'une lésion cérébrale ont été attribuées à un

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trouble du système nerveux central chez des enfants doués d'une intelligence essentiellement normale et ne présentant aucun signe de lésion cérébrale (Birch, 1964).

Clements (1966) emploie l'expression "dysfonction cérébrale mineure" pour décrire l'enfant dont l'intelligence globale est normale, mais dont le comportement présente des anomalies présumément associées à des troubles légers du système nerveux central. Il énumère les symptômes suivants, par ordre de fréquence, comme caractéristiques d'une dysfonction cérébrale minimale :

1. hyperactivité
2. troubles perceptivo-moteurs
3. instabilité affective
4. troubles de coordination
5. distraction
6. impulsivité
7. troubles de mémoire et de réflexion
8. difficultés d'apprentissage spécifiques
9. troubles de langage et d'audition
10. signes neurologiques équivoques et électro-encéphalogramme (EEG) irrégulier.

Clements ajoute que ces caractéristiques sont présentes chez les enfants dont les difficultés d'apprentissage proviennent d'une dysfonction cérébrale mineure.

Bien des théories ont été proposées pour expliquer comment les facteurs d'ordre neurologique influent sur les difficultés d'apprentissage. L'une des plus remarquables et des plus controversées est celle de l'Organisation neurologique de Delacato (1959, 1963).

L'auteur appuie sa théorie sur l'hypothèse que le développement neurologique suit le postulat biogénétique suivant : "l'ontogenèse est un résumé de la phylogénèse", c'est-à-dire que le développement de l'individu se déroule selon le modèle de l'évolution de l'espèce. Il soutient que si le développement neurologique ne se fait pas dans l'ordre, il s'ensuivra des problèmes de mobilité

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ou de communication. L'organisation neurologique de l'être humain se fait dans un ordre progressif, par le biais des niveaux anatomiques supérieurs du système nerveux central : 1) la moëlle épinière, 2) la protubérance annulaire 3) le mésencéphale, 4) le cortex, 5) le développement neurologique complet et l'établissement de la dominance cérébrale.

À partir de l'hypothèse que les problèmes d'apprentissage proviennent d'un trouble du développement séquentiel à un niveau quelconque, un profil de développement a été mis au point par la suite (Doman, Delacato, Doman, 1964), pour examiner les comportements existants, en vue de déterminer à quel niveau le développement a été perturbé. L'orientation thérapeutique proposée pour le traitement des troubles de développement identifiés consiste à "façonner" les aptitudes motrices de l'enfant (Delacato, 1966, Doman, 1967) en lui présentant des activités conçues pour pallier le manque de développement des étapes de la croissance neurologique jugées insatisfaisantes (Lerner, 1976).

Bien que la théorie Doman-Delacato ait été largement adoptée entre 1960 et 1965 (Gearheart, 1977) et ait semblé satisfaisante, d'après les rapports soumis sur le sujet, (Delacato, 1965), une dizaine d'associations professionnelles ont endossé, en 1968, un "énoncé officiel" critiquant sévèrement le traitement Doman-Delacato des enfants handicapés neurologiquement. Parmi ces associations, mentionnons la Canadian Association for Retarded Children et le Conseil canadien pour la réadaptation des handicapés (Cruikshank, 1968).

Ayres (1965, 1966, 1968, 1972, 1973) a proposé une autre théorie du rôle du système nerveux central dans l'apprentissage, beaucoup moins controversée, mais également fondée sur la notion d'évolution dans le développement. Il soutient que l'apprentissage est une fonction hautement complexe du système nerveux central. En termes très simples, "l'apprentissage est une fonction du cerveau; il semble que les difficultés d'apprentissage reflètent une déviation de la fonction neurologique". Le travail de Ayres (1972) est fondé sur l'hypothèse que le contrôle du comportement sensorimoteur repose sur une intégration neurophysiologique fondamentale, et qu'une amélioration de l'intégration sensorielle facilite l'apprentissage de l'enfant qui présente des problèmes dans ce domaine.

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L'hypothèse fondamentale étayant les théories de Ayres et Delacato sur les causes neurologiques des problèmes d'apprentissage repose aussi sur les théories perceptivo-motrices de Barsch (1967), Cratty (1967, 1969, 1971), Frostig (1970, 1972), Getman (1965, 1968) et Kephart (1971). Parallèlement, Keogh (1971) postule l'hypothèse d'un trouble neurologique pour expliquer l'hyperactivité : "c'est une explication d'ordre médical, qui suppose l'existence d'une étiologie organique spécifique".

Il existe une foule d'autres variations sur ce thème central, qui ont été popularisées par les recherches récentes. La notion de difficultés d'apprentissage découlant d'une dysfonction au niveau des hémisphères cérébraux, élaborée par Orton (1937), continue d'intéresser les chercheurs (Bryan et Bryan, 1975; Galin, 1976; Geschwind, 1968; Ketchum, 1967; Sperry, 1968; Teuber, 1967). Cette hypothèse a été étayée par les découvertes de Rourke (1973) dans une étude sur les déficiences motrices latéralisées et non latéralisées des enfants ayant des difficultés d'apprentissage.

Comme dans toutes les questions relatives aux difficultés d'apprentissage, les notions de dominance sont loin d'être admises par tous les auteurs (Ketchum, 1967). Selon Money (1966), "Une bonne partie de ce qui s'est écrit sur la dominance mixte n'a absolument aucune vraisemblance du point de vue anatomique".

Dans le domaine de la recherche sur le cerveau, certaines réalités discrètes d'ordre neurologique ont été déterminées, telles que le syndrome de Gerstmann (confusion de la gauche et de la droite, ignorance des doigts de la main et troubles d'écriture et de calcul reliés à une dysfonction d'une région circonscrite du lobe pariétal), mais si l'on excepte une foule de preuves non spécifiques des causes neurophysiologiques des difficultés d'apprentissage, les tentatives pour établir un rapport entre ces derniers et une dysfonction cérébrale n'ont guère apporté de lumières sur le sujet (Hackney, 1976).

Mentionnons un autre domaine de recherche : les relations entre les déséquilibres biochimiques et la fonction cérébrale. S'écartant de l'hypothèse selon laquelle les processus mentaux sont influencés par l'environnement ortho-

moléculaire du cerveau, bien des chercheurs se sont penchés sur le rôle des éléments chimiques dans la réflexion et le comportement, et les facteurs d'interférence possible avec cette influence biochimique. Birch et Gussow (1970), Cott (1972, 1974), Crevioto (1972) et Pauling (1968) parlent d'un rapport entre la malnutrition et les difficultés d'apprentissage. Selon eux, il existe un lien entre l'équilibre biochimique et les difficultés d'apprentissage, fondé sur la nutrition.

La théorie de Feingold (1975) sur le rapport entre les additifs alimentaires et l'hyperactivité ont retenu dernièrement l'attention des chercheurs. Dunn (1973) a constaté que de nombreux enfants en difficulté d'apprentissage souffrent d'hypoglycémie consécutive à la malnutrition.

À cet égard, Crook (1974) est d'avis que les difficultés de comportement et d'apprentissage peuvent être causées par des réactions allergiques aux aliments, ce qui peut affecter le système nerveux. Parallèlement, Wunderlich (1973) a décrit un "syndrome neuro-allergène" résultant de différentes allergies aux aliments.

Dans une autre étude sur la biochimie du cerveau, Rossi (1972) se demande si certaines formes de difficultés d'apprentissage peuvent découler de dysfonctions d'ordre constitutionnel, génétique et neurochimique. À l'appui de cette théorie, mentionnons l'étude de Silver (1971) portant sur 556 enfants qu'a permis d'établir un profil familial chez les enfants souffrant de troubles d'apprentissage d'ordre neurologique (Myers et Hammill, 1976).

De façon générale, les faits démontrent de plus en plus le bien-fondé de la théorie, de plus en plus acceptée, -- selon laquelle l'équilibre biochimique et neurophysiologique est essentielle à l'apprentissage optimal. Mais il faut reconnaître que les explications de l'étiologie des difficultés d'apprentissage demeurent théoriques : les chercheurs ne sont pas arrivés à préciser la nature complexe de la fonction physiologique d'une façon qui permette d'attribuer les difficultés d'apprentissage spécifiques à certaines causes biochimiques identifiables ou à une dysfonction du système nerveux central. Il est donc actuellement impossible de diagnostiquer les difficultés d'apprentissage à partir de critères neurologiques.

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Inévitablement, les effets de cette incertitude générale sur l'étiologie se répercutent au-delà de la théorie et touchent également les problèmes de l'évaluation neurologique. Malgré les progrès des dernières années, notamment l'importance de certaines découvertes neurologiques, on se heurte encore à la même absence de consensus et aux mêmes résultats contradictoires.

Des recherches médicales ont permis de définir, avec un certain degré d'exactitude, des normes fiables de dépistage des difficultés d'apprentissage accompagnés de signes évidents d'une dysfonction du système nerveux central. En d'autres termes, un examen neurologique conventionnel permet de déceler les symptômes "graves" d'une telle dysfonction (par exemple, troubles moteurs ou convulsions).

Mais l'enfant en difficulté manifeste généralement des déviations mineures, subtiles, imperceptibles ou des symptômes "légers" (par exemple, distraction, maladresse, troubles d'orientation spatiale) qui ne sont pas toujours décelables à l'examen neurologique (Lerner, 1972). En outre, ces symptômes légers existent souvent chez les enfants normaux. Il arrive souvent que l'examen neurologique permette de dépister, à partir de symptômes graves, des enfants en difficulté d'apprentissage, alors que des symptômes légers peuvent être observés autant chez ces derniers que chez les enfants normaux.

Comme le soulignent plusieurs études (Hart, 1974), Vuckovich, 1968), la présence ou l'absence de symptômes légers doit être interprétée avec prudence. Il est souvent difficile de distinguer, à la lumière de ces seuls symptômes, les difficultés d'apprentissage d'ordre neurologique et les autres, ou celles qui proviennent d'un manque de maturité découlant d'une dysfonction du système nerveux central.

Les éléments essentiels de l'examen neurologique en vue du dépistage des difficultés d'apprentissage ont été soulignés par bien des spécialistes (Clements, 1966; Crichton, 1972; Cruickshank, 1977; Lerner, 1976). Cet examen comprend globalement l'histoire des antécédents médicaux; l'examen des nerfs crâniens, l'évaluation de tous les éléments qui contrôlent la motricité, un électro-encéphalogramme (EEG) et, le cas échéant, un examen biochimique, endocrinologique et génétique (Lerner, 1976).

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La signification des irrégularités de l'EEG est aussi controversée que les symptômes légers. Mais selon une découverte intéressante, il semble que les enfants en difficulté d'apprentissage présentent une anomalie clinique commune : un rythme excessivement lent des ondes cérébrales, une réaction plus lente que la normale aux stimuli, tel qu'indiqué par le tracé électro-encéphalographique (Satterfield, 1973; Shields, 1973). Même si cette étude, qui montre une incidence élevée d'irrégularités dans le tracé EEG des enfants en difficulté d'apprentissage, confirme sensiblement les découvertes de Muehl et Forrell (1973-1974), les résultats indiquent que le groupe de ceux dont le tracé EEG était irrégulier présentaient moins de troubles de lecture que ceux dont le tracé était régulier.

Bien des tentatives ont été faites pour démontrer, à partir de techniques neuropsychologiques, le rôle du système nerveux central dans les difficultés d'apprentissage. Bien que les tests et les examens psychologiques ne fournissent qu'une information théorique sur les relations neurologiques, leur utilité réside "dans leur aptitude à élargir et à quantifier l'examen neurologique de sorte que les causes psychologiques des troubles neurologiques puissent être établies d'une manière relativement exacte" (Crichton et coll., 1972).

Les méthodes neuropsychologiques reposent sur l'hypothèse suivante : de la même façon que les symptômes de désordres neurologiques servent à diagnostiquer le syndrome de Strauss ou une dysfonction cérébrale minime en l'absence de confirmation neurologique, les résultats des tests psychologiques des enfants souffrant d'une dysfonction connue du système nerveux central dans les cas douteux. À partir de cette hypothèse, une foule de tests et de batteries de tests neuropsychologiques ont été mis au point pour mesurer le rôle des facteurs d'ordre neurologique.

Parmi ces tests, beaucoup ont été mis au point essentiellement à partir de tests de perception tels ceux de Bender et de Goldstein et la série de Kohs de l'échelle WISC pour le diagnostic du rôle des fonctions organiques (Frostig, 1961). La méthode "psychodiagnostique" de Mark (1966) repose sur l'hypothèse selon laquelle une dysfonction cérébrale mineure perturbe les fonctions conceptuelles et cognitives du système nerveux central. L'auteur a donc mis au point un moyen de dépister "les déficiences organiques" à l'aide

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d'une batterie de tests de rendement scolaire. Les tests de perception étant généralement considérés comme insuffisants pour atteindre le but pour lequel ils ont été conçus, leur extrapolation comme moyens neuropsychologiques a inévitablement donné lieu à une foule de critiques (par exemple, Stott, 1974). Malgré cela, d'autres recherches ont permis d'appuyer l'hypothèse d'une relation entre le rôle du système nerveux central et les résultats des tests de perception.

Salzarulo et coll., (1972), par exemple, a démontré que les tests de Bender et de Berges-Lezine peuvent servir à démontrer une relation entre les signes neurologiques correspondant à une lésion cérébrale hypothétique et les troubles d'orientation spatiale chez les enfants qui ont des difficultés d'apprentissage.

Le test intitulé "Digit Symbol Modalities" (Smith, 1968) a été mis au point pour répondre à deux objectifs particuliers: 1) fournir un instrument efficace et économique pour évaluer les aptitudes d'apprentissage des enfants apparemment normaux et dépister les troubles majeurs; 2) fournir une définition de la nature des déficiences résultant d'une lésion cérébrale et décelées par d'autres tests neuropsychologiques. Le test de Lincoln-Oseretsky sur la performance motrice (Sloan, 1955), qui mesure une gamme étendue d'aptitudes neuro-musculaires, a été utilisé par de nombreux chercheurs (Hurwitz et coll., 1972; Pyfer et Carlson, 1972) pour évaluer la condition neurologique. Parallèlement, les tests de discrimination motrice et tactile mis au point par Ayres (1966) permettent d'évaluer l'intégration sensorimotrice. Halstead (1947), Reitan et Heinman (1968), Crinella et Dreger (1972), Crinella (1973) et Connors (1972), entre autres, ont mis au point des moyens d'analyser les mécanismes neurophysiologiques sous-jacents, qui permettent de dégager une concordance significative entre les influences neurologiques et psychologiques.

Outre les tests et batteries de tests conçus essentiellement pour mesurer les aptitudes perceptives et qui ne fournissent que des renseignements par déduction, d'autres techniques neuropsychologiques, comprenant aussi des mesures neurologiques véritables, ont été mises au point. Zedler (1968) décrit une méthode de dépistage dans laquelle les relations entre les résultats obtenus (établis à partir du comportement de l'enfant durant les tests, les résultats de

l'échelle WISC et ceux de l'examen médical) sont évalués de manière statistique en vue de produire un "instrument de détection" à partir duquel on pourra obtenir une mesure "particulièrement sensible" des déficiences neurologiques mineures quantifiables. Dans le sillage de cette méthode, Eaves et coll., (1974) signalent l'existence de tests de dépistage comprenant des mesures psychologiques, neurologiques et scolaires qui ont permis de classer avec exactitude plus de 70% des enfants de maternelle. Parmi les enfants chez qui une dysfonction cérébrale mineure avait été diagnostiquée, 11% seulement pouvaient passer en 3^e année, comparativement à 86% des enfants normaux. Shields (1973) aborde l'étude neurologique des enfants chez qui des mesures spécialisées de fonctionnement cérébral (par exemple, un EEG) sont reliées à des processus d'apprentissage spécifiques mesurés à partir de tests de perception. À partir de ces deux mesures, des comparaisons avec les enfants normaux ont démontré l'existence de différences neurologiques chez les enfants en difficulté, ce que les résultats des tests avaient permis de vérifier.

Dans le domaine des tests neuropsychologiques, des recherches poussées sur la validité des normes de diagnostic ont été menées par Myklebust (1973a, 1973b). Après avoir établi dans deux études différentes mesures : ophtalmologiques et neurologiques, EEG, tests pédagogiques et psychologiques, l'auteur arrive à la conclusion que l'information neurologique est essentielle pour le dépistage et le diagnostic des troubles d'apprentissage.

En général, même s'il semble que la relation complexe entre le fonctionnement du système nerveux central et les difficultés d'apprentissage ne soit pas encore bien comprise, il ne fait pas de doute qu'il faut tenir compte de l'étiologie neurologique. La théorie de Luria (1966), selon laquelle les difficultés d'apprentissage spécifiques doivent être attribuées à certaines déficiences identifiables de la fonction neurologique, est typique de l'orientation des dernières recherches. On peut raisonnablement conclure, comme Myklebust et Boshes (1969), que la mise au point d'instruments neurologiques plus précis et plus sensibles permettra d'élaborer une définition dans laquelle les types de difficultés d'apprentissage seront classés selon leurs causes. L'état actuel de la recherche neurologique est bien représenté dans l'analogie de McGrady (1970), pour qui les techniques actuelles sont tellement grossières qu'elles reviennent à

pêcher la sardine avec un filet à baleines : "Il y a plein de sardines... mais on ne les attrape pas."

C'est la raison pour laquelle peu de définitions considèrent les troubles neurologiques comme condition nécessaire d'un diagnostic de difficultés d'apprentissage. La définition opérationnelle de Goodman et Mann (1976), selon laquelle "l'enfant souffre d'une dysfonction neurologique quelconque", est exceptionnelle. En général, on conclut que lorsque des enfants présentent une symptomatologie typique de difficultés d'apprentissage, on peut diagnostiquer que ces difficultés résultent d'une dysfonction présumée du système nerveux.

Même ceux qui ont préféré concentrer leurs recherches sur l'analyse du comportement observable, sans égard à l'aspect neuropathologique sous-jacent (par exemple, Capabianco, 1964; Valett, 1969), ne nient pas le rôle du système nerveux central dans les troubles d'apprentissage. Les tenants d'une orientation axée sur le rendement et les aptitudes plutôt que sur des conclusions neurologiques s'opposent non pas à l'étude de l'étiologie du système nerveux central, mais à la classification des difficultés d'apprentissage à partir de cette information.

Indépendamment de la valeur attribuée à l'information neurologique ou à l'importance qui lui est accordée au niveau du diagnostic et du traitement des difficultés d'apprentissage, une évaluation médicale, y compris un examen neurologique, est une condition standard d'admission à la plupart des programmes spéciaux. Dans leur rapport sur la visite d'écoles réservées aux enfants ayant des difficultés d'apprentissage (Pine School, Vt., Eagle Hill School, Mass.), Gordon et Lévesque (1976) soulignent que les candidats doivent présenter un rapport médical et neurologique complet. Hackett (1975), qui a fait une enquête sur les programmes spéciaux de l'Ouest de l'Ontario, conclut que "dès que l'on va plus loin que le diagnostic pédagogique de base, il semble que seuls les centres hospitaliers offrent des services de diagnostic objectifs et complets".

6. L'exclusion -- La notion d'exclusion sert à établir, à partir de fondements étiologiques, les caractéristiques des autres déficiences qui n'entrent pas dans la catégorie des difficultés d'apprentissage. En général, elle

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désigne surtout des problèmes découlant de certains handicaps : déficience mentale, troubles visuels ou auditifs, troubles sensoriels ou moteurs, perturbation affective, instruction fautive, privation culturelle ou pauvreté de l'environnement. Cette orientation repose sur l'hypothèse que le traitement des problèmes d'apprentissage résultant directement de ces facteurs diffère nettement de celui des difficultés d'apprentissage. Elle est confirmée par les recherches comparées de Sabatino et Hayden (1970) sur les enfants en difficultés d'apprentissage et les déficients mentaux, et celles de McCarthy (1969) et de Barr et McDowell (1972) sur les enfants en difficulté d'apprentissage et les enfants souffrant de perturbations affectives. Il ressort de ces études que les résultats d'ordre scolaire, affectif et cognitif du groupe d'enfants en difficulté diffèrent sensiblement de ceux des deux autres groupes, d'où la conclusion que les besoins pédagogiques de chacun des groupes sont différents.

Bien que certaines définitions englobent la cécité, la surdité, la déficience mentale, etc., la plupart ont recours à la notion d'exclusion pour distinguer entre les troubles d'apprentissage et les déficiences d'un autre ordre. Pour Clements (1966), par exemple, "des symptômes similaires peuvent ou non compliquer les problèmes d'enfants atteints de paralysie cérébrale, d'épilepsie, de déficience mentale, de cécité ou de surdité". Pour Cruickshank (1977), une difficulté d'apprentissage peut survenir à "n'importe quel niveau de fonctionnement intellectuel" et est "caractérisé par de nombreux éléments communs" aux difficultés d'apprentissage et aux autres problèmes. Par ailleurs, la définition du NACHC est l'une des nombreuses définitions qui excluent les difficultés d'apprentissage provenant surtout d'un handicap visuel, auditif ou moteur, de la déficience mentale, de la perturbation affective ou de la privation au niveau du milieu.

Pour rendre cette notion opérationnelle il faut fixer des normes d'admissibilité en rapport avec chacune des causes précisées dans la définition, ce qui élimine les déficiences considérées comme étrangères à la catégorie des difficultés d'apprentissage.

Comme l'expliquent Chalfant et King (1976) :

"When a child is referred for individual assessment, the status of the child's vision, hearing and motor performance, health impairments,

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level of intellectual functioning, environmental factors, and social-emotional adjustments are usually considered... Alternatives for identifying these problems include: a) observation, b) diagnostic teaching, c) psychological tests, d) referral for medical examination, e) psychiatric evaluation".

Indépendamment des moyens employés, pour que la notion d'exclusion soit applicable dans la pratique, l'information obtenue doit indiquer si elle répond ou non aux critères d'exclusion mentionnés. Essentiellement, l'évaluation des difficultés d'apprentissage résulte d'un "diagnostic par élimination", c'est-à-dire obtenu en éliminant systématiquement les autres causes possibles (McCarthy et McCarthy, 1970).

La déficience mentale, par exemple, peut être éliminée par l'application de certains critères d'ordre intellectuel; les enfants dont le rendement aux tests standard est inférieur aux exigences fixées sont exclus.

Les difficultés d'apprentissage reliées aux déficiences visuelles ou auditives peuvent être éliminées en fixant un niveau minimum de déficience visuelle ou auditive au-delà duquel un diagnostic de difficultés d'apprentissage peut être accepté. Pour déterminer si un enfant satisfait à la norme fixée, Underwood (1977) souligne: "Il faut mesurer les aptitudes sensorielles à l'aide de tests d'acuité visuelle et auditive (administrés par des spécialistes compétents)." Cela permet de dépister les enfants qui ne présentent pas d'insuffisance sensorielle mesurable ou qui sont atteints de troubles auditifs ou visuels déterminés, mais insuffisants pour aggraver ou entraîner des difficultés d'apprentissage connexes. Selon Hammill (1976) "les enfants présentant des déficiences graves, notamment dans le domaine du langage, ou dont l'acuité visuelle du meilleur oeil après correction ne dépasse pas 20/70 ne sont pas classés comme des enfants ayant des difficultés d'apprentissage.

Des examens ophtalmologiques et audiolgiques sont particulièrement importants pour établir les besoins pédagogiques particuliers des enfants en difficulté ou atteints de déficiences sensorielles (McGinnis, Kleffner et Goldstein, 1956). Ces examens sont d'autant plus importants qu'il est difficile de distinguer, en présence de diagnostics cliniques différents, une insuffisance

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visuelle d'une dyslexie visuelle, ou une perte d'audition d'une aphasie auditive (Goldstein, Landau et Kleffner, 1958). Comme l'explique Olson (1961) :

"Those who cannot hear (deaf) and those who seem unable to gain meaning respond to an audiometric examination in a similar fashion".

En examinant ce problème, Olson a constaté que le test ITPA permet de différencier ces deux groupes. Il suggère donc d'y recourir pour confirmer le diagnostic final.

L'exclusion des enfants dont les problèmes résultent de déficiences culturelles pose un problème de taille. Ayant observé un fort pourcentage d'enfants défavorisés présentant des difficultés d'apprentissage spécifiques (Kappelman, Kaplan et Gantes, 1969), certains ont avancé l'hypothèse que la prédominance de facteurs pouvant entraîner une dysfonction du système nerveux central (malnutrition, maturité précoce, etc.) pouvait augmenter considérablement les risques de difficultés d'apprentissage chez les enfants défavorisés (Newton, 1976; Birch et Gussow, 1970). Malgré cela, pour Myers et Hammill (1976), "comme il est difficile de déterminer quelles difficultés d'apprentissage proviennent du milieu, notamment s'il s'agit de déficiences mineures ou moyennes, les difficultés d'apprentissage de beaucoup d'enfants défavorisés ont été attribuées par erreur à leur milieu". Une étude de Franks (1971) portant sur un vaste échantillonnage de déficients mentaux légers et d'enfants en difficulté du Missouri confirme cette hypothèse : les Noirs représentaient 34% des déficients légers, contre seulement 3% des enfants en difficulté. Parallèlement, Kealy et McLeod (1976), qui ont étudié les relations entre les conditions socio-économiques et les difficultés d'apprentissage diagnostiquées chez 333 enfants des écoles publiques urbaines de l'Ouest canadien, ont découvert que 72,5% de ces enfants appartenaient à un milieu social favorisé, contre 35,2% vivant dans un milieu défavorisé.

En général, il appartient au diagnosticien de s'assurer que tous les moyens disponibles ont été employés pour déterminer si un problème d'apprentissage donné est indépendant ou non de certains handicaps connexes. La définition adoptée doit indiquer les critères opérationnels à satisfaire pour éliminer les problèmes autres que les difficultés d'apprentissage.

CONCLUSION

Nous avons cherché à rendre opérationnel chacun des éléments de définition des difficultés d'apprentissage, dans le but de fournir aux diagnosticiens un cadre de références leur permettant de dépister le plus exactement possible les enfants en difficulté d'apprentissage. Il existe actuellement bien des conceptions et des définitions différentes des difficultés d'apprentissage, mais toutes posent de nombreux problèmes au niveau de l'application pratique. Ainsi, les tests diagnostiques habituels peuvent aider à comprendre le problème d'un enfant, mais leur validité est loin d'avoir été démontrée (Coles, 1978).

La conception neurologique ne semble pas répondre aux besoins pédagogiques réels; la conception diagnostique est contestée en raison des rapports supposés qu'elle établit entre les aptitudes perceptives et les aptitudes scolaires; et l'on reproche à la conception pédagogique de ne pas faire la distinction entre les difficultés d'apprentissage proprement dits et les autres déficiences.

En raison des controverses non résolues sur ces différentes conceptions et des problèmes découlant des différents éléments utilisés dans ces définitions, il est inévitable que les spécialistes n'aient pas encore atteint un consensus sur la fréquence des difficultés d'apprentissage.

Comme le souligne Macy et coll., (1979), "Même si les définitions opérationnelles semblent avoir une certaine validité, il reste à voir jusqu'à quel point elles reflètent les définitions théoriques sous-jacentes et la signification des difficultés d'apprentissage". Ces auteurs mettent en garde contre "le danger de chercher à élaborer une définition opérationnelle à partir d'une notion multidimensionnelle comme celle de la difficulté d'apprentissage".

Le problème vient de ce que cette notion multidimensionnelle est actuellement envisagée à la lumière d'un ensemble de connaissances hypothétiques. Par exemple, la recherche a démontré l'influence incontestable des facteurs neurologiques, mais cela demeure insuffisant pour accepter une définition et un diagnostic reposant sur une conception purement neurologique des difficultés d'apprentissage.

DÉFINITION ET CLASSIFICATION

Fondamentalement, bien que les six éléments étudiés dans ce document soient importants pour faciliter la compréhension des difficultés d'apprentissage, ils doivent être soigneusement analysés avant d'être acceptés comme éléments de définition.

Récemment, Kirk et Gallagher (1979) ont indiqué que seuls trois critères pouvaient servir à définir les difficultés d'apprentissage : 1) écart entre les aptitudes, ou entre les aptitudes et le rendement, 2) facteur d'exclusion et 3) besoin de services spéciaux en matière d'éducation.

Ils proposent donc la définition suivante :

"A specific learning disability is a psychological or neurological impediment to spoken or written language or perceptual, cognitive, or motor behaviour. The impediment (1) is manifested by discrepancies among specific behaviours and achievement, (2) is of such nature and extent that the child does not learn by the instructional methods and materials appropriate for the majority of children and requires specialized procedures for development, and (3) is not primarily due to severe mental retardation, sensory handicaps, emotional problems, or lack of opportunity to learn".

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L'ENFANCE INADAPTÉE :

PROGRAMMES ET BESOINS

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INTRODUCTION

La présente monographie vise à introduire les enseignants, les administrateurs et les spécialistes au domaine de l'ENFANCE EN DIFFICULTÉ.

La présentation, la classification et la discussion des comportements et des caractéristiques de l'enfant en difficulté sont exposées de façon à permettre à celui qui travaille dans ce domaine de se familiariser avec la théorie et la recherche, dont la connaissance précède tout enseignement significatif.

Cinq sections majeures composent cette monographie :

1. les troubles du comportement;
2. les troubles de communication;
3. les difficultés d'ordre intellectuel;
4. les handicaps physiques;
5. les polyhandicapés.

Pour faciliter l'étude de ce document, chaque section est présentée selon la même séquence, à savoir : la définition et la classification, la fréquence, les causes, l'identification et l'évaluation, les besoins éducationnels.

I. LES TROUBLES DU COMPORTEMENT

A. Définition et classification

Généralement, les troubles du comportement correspondent à des comportements qui s'écartent des normes établies; ceux-ci s'accompagnent de difficultés académiques qui en découlent directement.

Pour définir et classer ces troubles du comportement, on doit se référer aux sous-catégories auxquelles ils appartiennent. Selon la documentation dans ce domaine, cette appartenance à des sous-catégories nous oblige à tenir compte des dimensions externes et internes des troubles du comportement. En conséquence, de leur dynamique sous-jacente doit résulter une classification qui, d'une part, tienne compte des problèmes qui relèvent de la personnalité même de l'enfant et des facteurs externes qui l'influencent, et qui, d'autre part, tienne compte des conséquences de ces troubles sur la croissance et le développement de l'enfant ainsi que sur d'autres personnes. Kirk (1972) définit un trouble de comportement de la façon suivante :

"A behaviour disorder is a deviation from age-appropriate behaviour which significantly interferes with 1) the child's own growth and development and/or 2) the lives of others" (p. 389).

Il suggère qu'il y a deux types de troubles : des perturbations affectives (emotional disturbance), et des mésadaptations sociales (social maladjustment).

Cette distinction provient, selon Kirk, des caractéristiques différentes de chacun de ces troubles. Ainsi, l'enfant affectivement perturbé est aux prises avec des conflits internes, des tensions, un climat général anxigène. Il en résulte chez lui des comportements névrotiques ou psychotiques. L'enfant dépressif, trop replié sur lui-même et hypersensible pourrait appartenir à cette catégorie.

Contrairement à l'enfant affectivement perturbé qui se voit défini suivant les effets constatés sur sa croissance et sur la structure de sa

personnalité, l'enfant mésadapté social se voit défini en fonction des attentes sociales développées pour lui. Ainsi, plus il sera différent des autres, plus ses comportements s'opposeront aux normes établies et plus ses mésadaptations sociales seront jugées sévèrement. Bien que tous ces enfants démontrent des comportements sociaux inacceptables, il n'en demeure pas moins que certains se voient facilement acceptés par leurs compagnons alors que d'autres sont rejetés du groupe social immédiat. Les enfants classés dans cette catégorie sont ceux qui déploient des attitudes agressives, antisociales, psychopathes, délinquantes.

La documentation regorge d'exemples de variations appartenant traditionnellement à la notion de troubles du comportement. Cruickshank (1975) définit ainsi un enfant qui démontre des troubles du comportement :

"A disturbed pupil who is persistently unable to cope with reasonable school environment even though expectations are geared to his age or potential" (p. 556).

De plus, il suggère que son comportement peut être :

- 1) "so disrupting as to violate the rights and educational growth of his peers; or he may
- 2) manifest social withdrawal; and/or
- 3) require an inordinate amount and depth of teacher involvement" (p. 556).

Lorsqu'on se réfère aux comportements observés, nous retrouvons respectivement sous les items 1) et 2) les enfants mésadaptés sociaux et ceux qui sont affectivement perturbés. L'item 3) se réfère au degré de la difficulté et peut être appliqué aux items 1) et 2).

Le département de l'Éducation de l'état du Michigan (1973) définit l'enfant perturbé affectif comme celui qui :

"is found to be emotionally disturbed through a complete medical diagnostic evaluation and :

- 1) whose emotional disturbance appears to cause an education deficit; and/or
- 2) is so disruptive within the regular education classroom that intensive education and therapeutic services are needed to assist in the reduction of disruptive behaviour; and/or
- 3) the child has a serious pathology not exhibited by disruptive behaviour, (withdrawn, socialization pattern)" (p. 8).

Une fois de plus, les items 2) et 3) correspondent à la classification traditionnelle des enfants mésadaptés sociaux et perturbés affectifs. L'item 1) se réfère à la cause de ces difficultés et peut être appliqué à l'un ou à l'autre, sans qu'il soit nécessaire d'ajouter une autre catégorie.

Quoi qu'il en soit, la classification traditionnelle des troubles du comportement telle que divisée en 1) enfants perturbés affectifs, et en 2) enfants mésadaptés sociaux, est celle qui reçoit le plus d'appui dans la documentation. Le SECC (The Canadian Committee, 1971) distingue désordres du comportement et désordres sociaux; cette distinction équivaut toutefois aux catégories que nous avons présentées.

Le ministère de l'Éducation de l'Ontario (1971) présente une définition plus explicite qui se situe dans le cadre général suivant :

"Emotionally and/or socially maladjusted refers to students who demonstrate one or more of the following characteristics :

- a) an inability to learn that cannot be explained by intellectual, sensory, or health factors;
- b) an inability to maintain satisfactory interpersonal relationships;
- c) inappropriate behaviour or feelings under normal conditions;
- d) a general, pervasive mood of unhappiness or depression;
- e) a tendency to develop physical symptoms, speech problems, pains or fears associated with personal or school problems.

This category includes the emotionally disturbed child who displays anxiety, neuroticism, or psychotic behaviour and the socially maladjusted child who displays truant, delinquent, or other socially unacceptable behaviour" (p. 23).

En résumé, la revue de la documentation suggère que les troubles du comportement soient inclus dans les deux sous-groupes suivants, à savoir, 1) les perturbations affectives et 2) les mésadaptations sociales. Par perturbation affective, on entend les difficultés du comportement qui proviennent des problèmes liés à la dynamique de la personnalité de l'enfant. Ceux-ci influent surtout sur la croissance et le développement de l'enfant. Ces difficultés émotives engendrent d'abord des comportements largement désordonnés comme des sentiments d'infériorité, une conscience de soi excessive, de l'anxiété. Elles peuvent également engendrer des comportements modérément déséquilibrés comme des conflits de personnalité et des névroses; ceux-ci pourront interrompre le développement et mener à des psychoses ou à de sévères dépressions.

La notion de mésadaptation sociale se réfère à des comportements socialement inappropriés. Les comportements sont alors perçus comme exceptionnels parce qu'ils diffèrent des normes établies et parce qu'ils dérangent les autres individus. Cette situation s'évalue principalement par la conduite de l'enfant et par sa capacité à répondre adéquatement aux demandes de son environnement. D'ailleurs, la notion de différence entre un comportement manifesté et un comportement souhaité est communément utilisée pour décrire les troubles de comportement. Selon Kirk (1972) les notions de perturbation affective et de mésadaptation sociale sont toutes deux incluses dans l'énoncé suivant :

"Behaviour disorders are the outcome of frustration resulting from the discrepancy between the child's capacity to behave, and the requirements of the environment" (p. 396).

De même, le Rapport Caldwell (Roberts et al, 1970) suggère que : "When we speak of the child and emotional and/or learning disorder, we are referring to a situation where there is typically a persistent imbalance in the interaction between the child and his environment, and between his capacities and the demands both internal and external that are made upon him. It is this imbalance which prevents him from adjusting successfully to these demands.

...In behavioural terms, these symptoms reflect an underlying disruption in the processes of adaptation and development" (p. 21).

B. Causes

Selon le ministère de l'Éducation de l'Ontario, (1971) :

"Perhaps the major problem in dealing with emotionally and/or socially disturbed children is that of identifying the underlying cause of their deviant behavior as a prerequisite to treatments" (p. 23).

Pourtant, il importe particulièrement de bien distinguer entre les problèmes dont les causes premières et secondaires sont d'ordre émotif, et les problèmes dont les causes sont d'ordre éthologique. À titre d'exemple, on sait que les besoins éducationnels de l'enfant affectivement perturbé sont bien différents de ceux de l'enfant qui a des difficultés d'apprentissage résultant d'un problème non identifié. On reconnaît ainsi que la prise de conscience et la compréhension des causes possibles des troubles du comportement sont essentielles au traitement éventuel.

Bien que l'approche de Stott (1978) ne sépare pas spécifiquement les désordres du comportement des difficultés d'apprentissage, il suggère tout de même quatre formes fondamentales de troubles du comportement qui causent l'échec de l'apprentissage. Ces quatre formes sont toutes associées à des handicaps de tempérament et représentent les quatre syndromes principaux du Bristol Social Adjustment Guide (BSAG; Stott and Marston, 1970; Stott, 1974) à savoir : la peur de la nouveauté, le retrait, la dépression et l'hostilité. Chacun de ces syndromes peut caractériser un style d'apprentissage déficient.

En ce qui a trait aux causes de ces syndromes, Stott (1978) suggère que :

"To a greater or lesser degree, they are brought on by adverse experiences. In the case of hostility, it is probably the result of the child's lack of faith in the continuance of his parents' protection and love. Depression may be the result of lack of sleep, exposure to a highly disorganized home environment, or chronic illness" (p. 29).

Le même auteur soutient que les causes d'échec de l'apprentissage sont précisément les quatre difficultés du comportement mentionnées plus haut. Cette interprétation insiste sur les problèmes d'apprentissage eux-mêmes plutôt que sur les troubles du comportement. Pour cette raison, Stott qualifie ainsi ces causes :

"originating causes in the sense that they are antecedent to and calculated to produce faulty learning attitudes" (p. 29).

Ces perturbations peuvent être inhérentes à la constitution de l'individu et résulter d'un mauvais développement physiologique ou environnemental et découler de fréquents changements à l'école sans le support des parents.

Cruickshank (1975) soutient que :

"Emotionally disturbed or socially maladjusted children are those, who because of breakdown in the family constellation, a developmental disturbance, or an economic, social, religious or ethnic conflict, fail to mature socially and emotionally within the limits which their society imposes" (p. 6).

Le même auteur dit encore qu'un tel enfant peut :

"responding out of a pattern of inadequate socialization (value incorporation defects or alienation) or inner stress and conflicts (reflecting flooded emotional states such as anger, fear, unworthiness, low self-esteem, defeat, and depression)" (p. 556).

Le rapport du SEEC (The Canadian Committee, 1971) se réfère aux facteurs générateurs, que sous-entend sa définition de l'enfant affecté par des troubles sociaux et éthologiques. Cet enfant est donc celui qui manifeste des comportements qui sont des :

"Inconsistent responses to life situations and frequent significant difficulties in school achievement, in social relationships, in sense of self-esteem, which may result from experience and/or biological limitation.

Problems of adjustment and communications in the school system related to ethnic and cultural differences" (p. 45).

Cependant, une explication de cette définition est donnée lorsqu'il est fait mention que :

"It does not mean that cultural differences are, in themselves undesirable, but where these create a problem for a child's integration into the school system...schools must be prepared to offer some form of remediation" (p. 45).

C'est probablement Kirk (1972) qui présente la revue la plus exhaustive des causes de troubles du comportement. Il classe ces causes en trois groupes principaux : des facteurs psychologiques, des facteurs psychosociaux, et des facteurs organiques. Pour appuyer sa théorie des causes psychologiques, Kirk ajoute que la frustration est surtout responsable de l'émergence des troubles du comportement. De plus, selon la nature des expériences qui ont engendré la frustration, on peut s'attendre à trois réactions possibles, soit, l'agression, la régression et/ou la résignation. Par exemple, lorsqu'un comportement désiré rencontre un obstacle, l'individu devient frustré; cette frustration produit une réaction marquée par de l'agressivité, de la bagarre, un langage abusif et de la colère. Une attitude régressive se manifestera lorsqu'on refusera à l'enfant un objet qu'il désire, ou une activité qui lui est déjà familière; ces refus rappelleront constamment à l'enfant qu'il perd quelque chose. La résignation découle d'une perte de motivation et de l'incapacité à réagir de façon constructive à telle ou telle situation. Cela vient d'une frustration répétée.

Une fois de plus, Kirk utilise la différence entre la capacité éthologique et les exigences de l'environnement pour expliquer des situations dans lesquelles un individu fait face à des tâches trop difficiles, ou se voit contraint d'emprunter une seule de deux voies impossibles qui se présentaient à lui. De telles situations aboutissent à des déviations de l'agressivité, à de la

régression, à un comportement compulsif, à des fixations et à toutes sortes de réactions bizarres. Ainsi, en milieu scolaire, l'enfant dont le rythme intellectuel est plus lent ou endommagé et qui doit constamment réaliser des tâches qui consacrent son échec, pourra développer des attitudes agressives ou hostiles; il tentera peut-être aussi d'éviter cette situation contraignante en se comportant de façon reprehensible.

Les facteurs psychosociaux générateurs de troubles du comportement peuvent être liés à :

- 1) des expériences familiales;
- 2) certains aspects de l'environnement social et économique de l'enfant.

Plusieurs chercheurs ont tenté d'identifier les prédispositions aux troubles du comportement en se penchant sur l'environnement familial des enfants qui sont affectivement perturbés. Jenkins (1966) a réussi à isoler un ensemble de comportements propres à certains types d'environnements familiaux. Ainsi, l'enfant timide, retiré, renfermé, provient habituellement d'un milieu où les deux parents sont présents, où le sentiment de rejet est minime, et où la mère ne déploie pas d'hostilité. Par contre, les mères d'enfants névrotiques et très anxieux sont elles-mêmes fréquemment névrotiques.

Lorsque Kirk discute des expériences de la jeune enfance, il souligne que les méthodes employées pour élever les enfants sont primordiales. Ainsi, il a trouvé que l'environnement familial des enfants affectés de troubles de conduite est souvent un milieu où la discipline est inconsistante et où les parents démontrent du rejet et de l'hostilité. De plus, les membres de ces foyers s'expriment peu d'affection. Pour leur part, les familles de délinquants illustrent le fait que plusieurs facteurs doivent être réunis pour créer une telle situation. Il n'est alors pas rare de retrouver à la fois un climat général querelleux, une discipline de laisser-faire, une mère négligente, dont le modèle est faux, et dont la discipline est punitive et erratique.

Les facteurs économiques et sociaux qui influencent le développement sont largement déterminés par les conditions économiques de la famille, par les valeurs transmises dans l'environnement immédiat, et par les valeurs socioculturelles véhiculées par l'école et la communauté. Kirk soutient qu'une

combinaison de facteurs est à la base d'un développement de troubles du comportement. Ces facteurs peuvent être présents soit dans la famille, à l'école ou dans l'environnement. À titre d'exemple, on constate que la pauvreté, l'affiliation avec une sous-culture délinquante, l'obligation "d'être un dur", etc. peuvent entraîner des troubles du comportement.

Certains facteurs physiologiques peuvent aussi causer des déviations du comportement. Selon Kirk, plusieurs problèmes, tant émotifs qu'éthologiques découlent d'un mauvais fonctionnement physiologique causé par des dérangements glandulaires, des déséquilibres biochimiques, des fatigues chroniques, une nutrition insuffisante ou inadéquate.

C. Fréquence

Lorsque la documentation mentionne les taux prédominants de troubles du comportement, ces taux varient autant que pour quelque autre condition exceptionnelle; tout dépend du critère dont se sert le chercheur pour déterminer les anomalies.

Rutter et Graham (1970) ont étudié 2 200 enfants de 9 à 11 ans pour en déduire que 5.7% avaient des troubles considérés importants d'un point de vue psychiatrique.

D'après le ministère de l'Éducation de l'Ontario, 4% des écoliers sont soit perturbés affectifs (1%) ou méadaptés sociaux (3%). Les estimations du U.S. Office of Education (1974) et du ministère de l'Éducation du Québec (1972) en établissent cependant 2% et 2,25% respectivement.

Malgré la diversité d'opinions, on peut assumer que quelque 4 à 5% des enfants ont des problèmes de comportement en milieu scolaire, dont seulement 2% ne peuvent fonctionner sans qu'il y ait des modifications apportées au programme régulier.

D. Identification et évaluation

Une déviation de conduite nécessitant une attention éducative particulière se décèle dès les premières années scolaires de l'enfant.

Lorsqu'il s'agit de cas sérieux, du moins, les caractéristiques distinctives se manifestent dès le jeune âge, surtout si l'enfant présente un problème disciplinaire. Il importe, cependant, que les enseignants prennent aussi conscience de l'existence d'autres anomalies qui ne nuisent pas à la classe, telles que la dépression, l'anxiété excessive, ou les changements subits dans la personnalité de l'enfant.

Le ministère de l'Éducation de l'Ontario (1971) a publié une liste des caractéristiques distinctives des troubles du comportement.

- A. Aptitudes intellectuelles, sensorielles, motrices et physiques sensiblement inférieures à la moyenne.
- B. Incapacité à établir et à maintenir des relations sociales.
- C. Inadaptation aux situations de tous les jours.
- D. Une diversité de comportements excessifs à partir de l'hyperactivité, l'impulsion, jusqu'à la dépression et le repli sur soi.
- E. Les symptômes physiques :
 - 1. Difficultés physiques fréquentes.
 - 2. Prédilection aux accidents.
 - 3. Anxiété par rapport à sa santé.
 - 4. Simulation de maladie.
 - 5. Se servir d'un trouble physique pour excuser ses tensions nerveuses.
- F. Régression (recul), retour aux troubles de conduite antérieurs.
- G. Agressivité : hostilité envers ses enseignants, ses compagnons ou ses parents; vouloir régler soi-même ses problèmes.
- H. Retrait dans le fantasme :
 - 1. Rêveries
 - 2. Rapports peu satisfaisants avec ses parents ou ses enseignants.
 - 3. Solitude en classe.
- I. Crainte de l'échec et de la critique; perfectionnisme périodique.

3. Développement de phobies et de compulsions (p. 41; traduction).

Les enfants chez qui l'on distingue régulièrement l'un ou l'autre des symptômes mentionnés et qui ne peuvent, distinctement, profiter de l'instruction donnée dans les classes régulières, devraient subir un examen approfondi.

Suivant la gravité du problème, on aura recours à un psychologue et/ou à un psychiatre pour le diagnostic.

Dans le domaine des troubles du comportement, l'évaluation doit pouvoir distinguer entre les problèmes d'origine psychologique et les problèmes découlant d'autres conditions exceptionnelles. Cette distinction importe particulièrement pour l'apprentissage des enfants handicapés; en effet, ceux-ci développent souvent de sérieux problèmes émotifs si l'incapacité elle-même n'est pas identifiée.

Selon Freedman et al (1972), l'évaluation d'un cas de trouble du comportement devrait tenir compte des facteurs suivants: l'histoire de la famille, l'apprentissage initial, l'examen psychiatrique, l'évaluation neurologique et les tests psychologiques, ces derniers portant sur l'intelligence, les aptitudes, l'empressement, l'accomplissement et la personnalité.

Quelle que soit la méthode employée, l'évaluation vise à préciser la nature du problème de l'enfant, ses causes, sa gravité, ses conséquences et sa contribution aux difficultés d'apprentissage. Essentiellement, le rapport final d'évaluation devra contenir toute information pertinente pouvant aider à l'établissement d'un programme éducationnel approprié.

E. Besoins éducationnels

Les exigences éducatives varient selon le genre et la gravité de l'incapacité chez l'enfant. À cette fin, une gamme étendue de services particuliers doit être mise à la disposition des enfants de cette catégorie de condition exceptionnelle.

Les enfants affectés de troubles "bénins" demeurent habituellement dans les classes régulières. Dans ces cas, l'évaluation vise à permettre à l'enseignant de mieux comprendre l'enfant et à lui indiquer les meilleurs moyens de l'aider.

Pour mieux comprendre et envisager les difficultés occasionnées par les problèmes "bénins" de certains enfants, l'enseignant devra à l'occasion, consulter le personnel de l'enfance en difficulté. Nonobstant ce fait, l'enfant demeure d'abord sous la responsabilité de l'enseignant (Kirk, 1972).

Dans les cas moyens, il suffira peut-être que ces enfants aient des consultations régulières, qu'ils assistent à temps partiel à des programmes, ou qu'ils s'inscrivent à temps partiel dans des classes particulières.

Le recours aux classes spécialisées, aux écoles particulières de jour, aux internats, aux hôpitaux psychiatriques ou aux cliniques pour déficients mentaux se révélera peut-être nécessaire pour les élèves affectés de sérieux troubles du comportement.

Lorsqu'il s'agira de déterminer les besoins éducationnels de l'enfant sévèrement inadapté aux classes normales, toute décision relative au choix d'une école particulière ou d'un centre résidentiel dépendra entièrement du milieu familial de l'enfant.

Selon Freedman et al (1972) :

"Residential treatment is used if a child's symptoms indicate serious pathology that is supported, maintained, aggravated and possibly caused by the environment within which he lives. It is used if the child is... amenable to a treatment program offering 1) separation from his environment 2) a corrective emotional experience through daily care 3) an opportunity to make use of individual psychotherapy 4) an opportunity for the parents to make use of psychological help" (p. 659).

Autrement,

"Helping a child within the home and community offers the advantage of permitting simultaneous change in child and parents, so that readaptation is facilitated" (p. 660).

Évidemment, les programmes établis pour les enfants affectés de troubles du comportement insistent davantage sur le développement

psychosocial que ne le font les programmes ordinaires. De plus, les éducateurs s'intéressent davantage à la famille de l'élève, puisque c'est au foyer que se découvrent assez souvent les facteurs qui contribuent à accentuer le problème de l'enfant et aussi à le maintenir. Donc, en cas de troubles du comportement, les responsabilités des professionnels de la santé et celles des éducateurs se chevauchent grandement. Traditionnellement, la responsabilité première du traitement incombait à la profession psychiatrique/médicale. Cependant, depuis quelques années, à cause de la tendance à diriger les cas vers les soins en résidence, ainsi que de l'augmentation des services spécialisés disponibles pour les cas bénins et moyens en milieu scolaire, la responsabilité est partagée.

Selon Kirk (1972),

"...there has been a shift in emphasis and responsibility from 1) the medical profession being the responsible agent for treatment, using teachers as auxiliary personnel, to 2) the schools becoming the responsible agents for treatment, with the auxiliary assistance of psychiatrists, psychologists, social workers and others as conjunctive personnel" (p. 402).

Malgré ce changement, chacune de ces deux professions doit participer au traitement de l'enfant qui souffre de troubles du comportement et reconnaître l'importance de l'interdépendance de leurs disciplines.

Lorsqu'il sera question de modifier une classe régulière pour accommoder un cas de troubles du comportement, il faudra s'en tenir au niveau intellectuel de l'élève et déterminer à quel point ses difficultés ont retardé son développement.

En général, on prétend que l'apprentissage normal peut reprendre dès que les problèmes psychosociaux disparaissent. À cette fin, plusieurs moyens furent mis en oeuvre, tels que la psychodynamique, la modification du comportement, la psycho-éducation, etc. (Kirk, 1972). Certains de ceux-là s'attaquent aux symptômes des troubles du comportement en assumant que le problème peut se résoudre en changeant ou en améliorant le comportement. D'autres essaient d'éliminer les causes des troubles, telles que l'environnement de l'enfant ou le dynamisme de sa personnalité.

Quelle que soit la méthode utilisée, l'objectif fondamental demeure celui de réorganiser sainement la personnalité et d'améliorer l'adaptation émotionnelle.

De plus, les moyens indiqués dans la documentation ont certains objectifs en commun : l'importance d'un bon rapport enseignant-enfant, de relever l'opinion que l'enfant a de lui-même, d'améliorer son habileté et de l'inciter à mieux accepter ses responsabilités.

Pour traiter les troubles du comportement, on a souvent recours à la psychopharmacothérapie.

Les médicaments les plus fréquemment prescrits pour l'enfant en difficulté sont les sédatifs, les stimulants, les antidépresseurs et les somnifères, suivant la nature des troubles du comportement. Ces produits chimiques, cependant, bien qu'ils atténuent les réactions de l'enfant envers ses difficultés, ne peuvent évidemment éliminer son comportement acquis, ses traits de caractère ou ses attitudes névrotiques.

Généralement, les caractéristiques de l'enfant dont le comportement est anormal détermineront le genre de programme éducationnel répondant le mieux à ses besoins.

II. LES TROUBLES DE COMMUNICATION

INTRODUCTION

Selon le ministère de l'Éducation de l'Ontario (1976), dans ce domaine, on retrouve les classifications suivantes :

1. déficience auditive;
2. difficultés d'apprentissage, (handicaps perceptifs, faiblesse neurologique, etc...);
3. troubles d'élocution et de langage.

Dans cette classification, les enfants sont groupés selon les caractéristiques de leur apprentissage. La caractéristique commune à chaque type d'exception est une rupture des fonctions réceptrices ou émettrices, essentielles à la communication.

Notons que cette approche s'éloigne des autres classifications rencontrées dans la documentation sur le sujet. On doit également ajouter que, lorsqu'il est question de classer des difficultés d'apprentissage, des difficultés auditives et des troubles du langage, on rencontre de nombreuses variations.

Par exemple, Reynolds et Birch (1977) classent les enfants en difficulté en sept groupes, dans lesquels les difficultés d'apprentissage, les difficultés auditives et les troubles du langage occupent une place distincte et prioritaire.

L'État du Michigan (1973) s'éloigne encore plus de l'approche du Ministère lorsqu'il assimile les difficultés auditives aux handicaps physiques. De plus, celui-ci regroupe les troubles du langage, les défauts de perception et les difficultés d'apprentissage dans la catégorie des autres conditions.

Le Conseil d'Éducation de Carleton (1973) classe les troubles du langage et de l'audition dans la catégorie des "handicaps physiques" alors qu'il assimile les désordres du langage à la sous-catégorie des "troubles d'apprentissage".

Selon le SEEC (The Canadian Committee, 1971) la rupture dans la communication constitue le facteur-clé qui différencie tous les cas de difficultés. La rupture dans la communication n'est donc pas en elle-même un cas d'exception :

"...communication, or with the handicapped impaired communication, is ubiquitous in its relevance and significance. In children with sensory impairments, and those with speech disorders, communication is a relevant factor. Increasingly, communication disruption, therefore, represents a common thread which runs through all categories of exceptionalities" (p. 14).

Ainsi, les difficultés auditives "organic and psychogenic hearing deficit; communication disorders related to hearing loss" et les troubles du langage "language impairment related to inability to acquire skills through the usual auditory channels" sont définis comme des désordres sensoriels. De plus les troubles d'élocution appartiennent, par définition, à un domaine de difficultés ("deviations in which draw attention to the manner of speech or interfere with the ability to comprehend or formulate speech and to express their intentions effectively") différent de celui des problèmes de langage. Les difficultés d'apprentissage ("Inability to learn in the usual or normal manner despite emotional, motor, sensory and intellectual integrity") font alors partie de la catégorie des difficultés primaires d'apprentissage, sous l'item : rendement intellectuel inférieur à la moyenne.

Pareille diversité d'opinion, en ce qui a trait à la classification des troubles de communication, illustre les problèmes majeurs que rencontre l'enfant en difficulté. D'ailleurs, la revue de la littérature révèle nombre d'autres phénomènes irrésolus en ce domaine; par exemple, les enfants handicapés par leur incapacité de comprendre ce qu'ils entendent et ceux qui sont handicapés par leur incapacité de s'exprimer verbalement ont-ils les mêmes besoins éducationnels?

Les éducateurs sont également divisés sur le fait de savoir si l'enfant qui est muet et qui a des troubles de verbalisation devrait appartenir à la même catégorie que l'enfant qui entend normalement et qui a des troubles de verbalisation. En effet, ces deux enfants ont besoin d'un programme de développement du langage et devraient par conséquent suivre un même programme éducationnel. D'autre part, ces enfants devraient être classés diffé-

remment puisque leurs problèmes auditifs ne sont pas les mêmes. Actuellement, on semble vouloir classer les difficultés auditives dans la catégorie des désordres sensoriels pour les distinguer des difficultés d'apprentissage, ou du langage. Kirk (1972) fait une distinction entre les troubles de communication qui incluent, a) les difficultés d'apprentissage, et b) les troubles du langage - et les handicaps sensoriels qui incluent, 1) les handicaps auditifs, et b) les handicaps visuels.

Malgré une certaine inconsistance dans la classification, les auteurs semblent néanmoins s'entendre en ce qui a trait aux troubles de communication. Ainsi, la définition des troubles de communication présentée par le Conseil de l'Enfance Exceptionnelle (1977) peut servir à appuyer la classification des déficiences auditives, des difficultés d'apprentissage, des troubles du langage :

"Individuals with communication disorders are those who exhibit an impairment in speech and/or language (including impaired articulation, stuttering, voice impairment, and a receptive or expressive verbal language handicap). That is sufficiently severe to adversely affect the performance of an individual in the usual school program" (p. 2).

De même, Gallagher (1975) suggère que :

"The field of communication disorders is concerned with disturbances of language and development behaviour which results from sensory deprivation, central nervous system dysfunction, mental retardation, and various other conditions. It includes professionals from many disciplines such as speech and language pathology, audiology, learning disabilities and education of the hearing impaired. The emphasis of research and practice relates to the perception, comprehension and use of auditory language reading, written language, and other symbol systems. Although there is overlap among fields, the central focus is on those variables which facilitate or impede communication" (p. 362).

Ainsi, les sous-catégories des troubles de communication qui seront présentées dans cette revue de la documentation comprendront :

1. les déficiences auditives;
2. les difficultés d'apprentissage; et
3. les troubles de la parole et du langage.

1. LES DÉFICIENCES AUDITIVES

A. Définition et classification

Selon le ministère de l'Éducation de l'Ontario (1971), les enfants affectés de troubles auditifs sont ceux qui :

- i) "are hard of hearing and have a hearing loss of a degree that holds back the development of clear speech and language, but which is not so severe as to prevent the development of speech and language, with or without sound amplification; and/or,
- ii) are deaf and have a hearing loss in the better ear to such a degree that they cannot understand and acquire speech and language through the sense of hearing even with sound amplification".

Bien que les définitions actuelles présentent quelques différences, elles divisent uniquement les troubles auditifs en deux groupes : les sourds et les durs d'oreille. Le Conseil Canadien de Coordination de la Déficience Auditive (C.C.C.D.A., s.d.) a adopté les termes de "surdité profonde (totale)" et de "durs d'oreille" pour se référer aux deux groupes déjà mentionnés.

Cette distinction, basée sur le degré de la perte de l'ouïe, est d'une très grande importance. En effet, le développement de ceux qui ne peuvent absolument pas compter sur l'audition dans leur apprentissage diffère de celui des personnes dont l'ouïe peut être améliorée par des moyens artificiels. Ainsi, on constate que le degré de surdité est le facteur le plus important dans la classification des désordres auditifs.

Dans une perspective éducative, certains auteurs suggèrent cependant de prendre d'autres variables en considération dans la classification des problèmes auditifs. Kirk (1972) soutient que le moment d'apparition du mal importe également dans cette classification. Il va de soi que l'enfant qui deviendrait sourd après avoir appris à parler réagirait bien différemment de celui qui n'aurait pas encore appris à le faire. Kirk s'explique ainsi :

"This is particularly important from an educational point of view because if an individual has already acquired speech before the loss of hearing, the whole communication and educational process is different from that used with persons who have never known speech or language" (p. 210).

Ce facteur, le moment d'apparition du mal, a également été accepté par la Conference of Executives of American Schools for the Deaf (1975). Cette association s'est récemment jointe à la Convention of American Instructors of the Deaf pour définir ainsi la surdité :

"Prelingual deafness : deafness present at birth, or occurring early in life at an age prior to the development of speech or language.

Postlingual deafness : deafness occurring at an age following the development of speech and language" (p. 510).

La troisième variable, qui viendra influencer les besoins éducationnels de ceux qui ont des problèmes auditifs, est le type de perte auditive. En raison de la complexité de la structure et du fonctionnement de l'oreille, Kirk suggère que les déficiences auditives peuvent prendre plusieurs formes différentes. Ces déficiences sont habituellement de deux types : 1) la perte de conduction, c'est-à-dire la réduction de l'intensité du son qui parvient à l'oreille interne; toute situation qui perturbe la séquence des vibrations ou qui empêche ces vibrations d'atteindre l'oreille interne causera une perte de conduction; 2) la perte neuro-sensorielle ou de perception; celle-ci résulte de déficiences du nerf sensoriel de l'oreille interne, ou de déficiences du nerf auditif qui transmet l'impulsion au cerveau. Kirk ajoute qu'un diagnostic adéquat de ce phénomène est une chose très importante et très technique. Il va de soi que le traitement approprié ainsi que les programmes éducatifs et même le choix d'une prothèse auditive en dépendront. Ainsi, un enfant affecté de déficiences neuro-sensorielles ne profiterait pas d'une prothèse auditive.

Ainsi, les variables importantes à la classification des troubles auditifs sont : 1) le degré de perte auditive (les sourds et les durs d'oreille; 2) le moment d'apparition du mal (avant ou suivant l'apprentissage du langage); et 3) le type de perte auditive (perte de conduction ou neuro-sensorielle). De ces trois facteurs le degré de perte auditive importe certainement le plus. En effet, dans une perspective éducative, l'éducation de l'enfant dur d'oreille se fera par les voies auditives alors que celle de l'enfant sourd dépendra de modalités indépendantes de son oreille (Kirk, 1972).

Soulignons également que la démarcation entre le sourd et le dur d'oreille peut se définir de façon fonctionnelle. C'est du moins ce que croit l'International Standard Organization (ISO, 1964). Ainsi, les déficiences sont

mesurées en termes de décibels. Le rapport COPEX (ministère de l'Éducation du Québec, 1977) établit la classification suivante :

"Surdité : personne qui sur la foi d'un examen approprié a une perte auditive se situant à 80 décibels et plus à l'écoute de la meilleure oreille.

Demi-surdité : personne qui sur la foi d'un examen approprié a une perte auditive se situant entre 25 et 80 décibels à l'écoute de la meilleure oreille" (p. III).

Reynolds et Birch (1977) diffèrent d'opinion à cet égard :

"A widely used cut off point indicates that deaf children have hearing losses greater than 90 decibels in the better ear and that hard of hearing persons have hearing losses not that great" (p. 532).

Selon, ce même auteur, il existerait six classes de pertes auditives et de handicaps auditifs :

insignifiants (0-25 db)

bénins (26-40 db)

moyens (41-55 db)

marqués (56-70 db)

sérieux (71-90 db)

extrêmes (91- db)

B. Causes

Il ressort donc de la revue de la documentation que deux méthodes principales servent à classer les troubles auditifs. Selon la première méthode plusieurs chercheurs ont choisi d'assimiler leurs causes à deux groupes de facteurs : des facteurs héréditaires et d'autres facteurs extérieurs. Le CCCDA qualifie ces facteurs de "surdité héréditaire" et de "surdité congénitale". Hewitt (1977) suggère la distinction suivante :

"Endogenous deafness is the result of an inherited defect; exogenous deafness is caused by disease or injury" (p. 154).

La surdité héréditaire résulte d'antécédents de déficiences auditives. Selon Davis et Fowler (1960),

"If both parents have true hereditary deafness, their children will almost certainly be born deaf or soon become deaf" (p. 110).

Mindel et Vernon (1971) ont trouvé que la surdité résultait de facteurs héréditaires dans 5,4% des cas lorsque les deux parents étaient sourds et dans 26,4% des cas lorsque n'importe lequel membre de la famille était sourd. L'ostéosclérose est une maladie héréditaire pouvant affecter l'ouïe à tous les stades de la vie; la dégénérescence du nerf auditif semble aussi héréditaire (Kirk, 1972).

La surdité congénitale découle d'un plus grand nombre de facteurs. Le CCCDA suggère les facteurs suivants :

"...maladie infectieuse maternelle durant la grossesse, telle que la rubéole ou les effets toxiques de certaines drogues sur l'embryon;

...un accouchement prématuré, l'anoxie (diminution de l'apport vital d'oxygène) ou toute lésion cérébrale subie par le bébé, peuvent également entraîner une perte d'audition;

...les deux principales causes à la source d'hypoacousie à un âge plus avancé sont le bruit et le vieillissement. Les maladies infantiles comme la scarlatine, la méningite et la rougeole peuvent conduire à une hypoacousie, mais plus rarement qu'autrefois. Parmi les autres origines de la surdité, on peut citer les infections sévères de l'oreille, les chocs traumatiques et les effets nocifs de certains stupéfiants, pris à dose massive" (p. 4).

On peut aussi classer les causes de surdité en assimilant les facteurs étiologiques en trois groupes, à savoir : ceux qui surviennent avant la naissance, pendant l'accouchement et après la naissance. Bussières et Brazeau (1975), ont établi la table des "Causes de la surdité" (p. 20) suivante :

1. Prénatales :
 - hérédité
 - génétique
 - rubéole
 - thalidomide
2. Périnatales :
 - difficultés à la naissance
 - prématurité et postmaturité
 - maladie hémolytiques
 - ✓ RH/Kernictère
3. Postnatales :
 - méningite
 - rougeole, oreillons, fièvres
 - streptomycine

Kirk (1972) en arrive à la même classification des causes : causes survenant avant, pendant et après la naissance. Il explique qu'avant la naissance, des infections prénatales et des conditions toxiques chez la mère peuvent affecter l'ouïe de l'enfant. Ces infections peuvent inclure des virus dont les oreillons, la grippe, la rubéole et des maladies comme l'ostéosclérose. À la naissance, des dommages au système nerveux central peuvent causer des déficiences auditives chez l'enfant. Ainsi, l'usage des forceps, des hémorragies intracrâniennes, un manque d'oxygène provoqué par un travail prolongé, des tranquillisants trop forts, l'obstruction des voies respiratoires de l'enfant, l'incompatibilité sanguine entre la mère et l'enfant sont tous des facteurs qui pourraient endommager l'ouïe de l'enfant. Après la naissance, les maladies contagieuses comme la scarlatine, les oreillons, la diphtérie, la toux prononcée, la rougeole, la fièvre typhoïde, la pneumonie, l'influenza sont reconnues comme causes de surdité. D'autres facteurs peuvent également contribuer au même mal. Ainsi en est-il de l'otite (infection de l'oreille interne) de la méningite, des chocs violents au cerveau, des tumeurs intracrâniennes et de certaines drogues toxiques. Mais la cause la plus répandue demeure la "presbycusie", c'est-à-dire, une détérioration de l'ouïe liée au vieillissement. Finalement, il existe des troubles auditifs dont la cause peut être psychologique ou émotionnelle. La surdité hystérique illustre cette situation psychogénique.

Malgré les progrès de la science en ce domaine, il semble que les causes de la majorité des troubles auditifs demeurent inconnues. Selon le Plan Quinquennal (ministère des Affaires sociales, Québec, 1977),

"...30 à 40% de la surdité demeure d'étiologie inconnue" (p. 5).

C. Fréquences

Le SEEC (The Canadian Committee, 1971), qui fournit des statistiques pour chaque province canadienne, indique que 0,575% des écoliers sont sourds ou durs d'oreille. Ces données, semblables pour les 10 provinces, sont basées sur les inscriptions dans les écoles primaires et secondaires; elles ne rendent compte que des cas identifiés nécessitant une éducation spéciale.

Contrairement au SEEC, le CCCDA (s. d.) soutient que 10% de la population scolaire est sourde ou dure d'oreille. On peut cependant croire que ces données englobent toutes les catégories de surdité, et cela, à tous les niveaux.

Généralement, les estimations de fréquence des difficultés auditives chez ceux qui requièrent une attention médicale ou éducative, varient, selon Kirk (1972), entre 2 et 5%.

D. Identification et évaluation

Comme c'est le cas pour toutes sortes de difficultés, l'identification des troubles auditifs est essentielle pour réduire au minimum les effets néfastes et maximiser les effets des programmes.

Les raisons pour lesquelles une identification précoce est importante sont soulignées par le Plan Quinquennal (ministère des Affaires sociales, Québec, 1977) :

- "- assurer que l'acuité auditive résiduelle reçoit une stimulation maximale durant toute la période cruciale de développement, c'est-à-dire, entre 0 et 5 ans;
- le manque de soins concrets en bas âge (0-5 ans) ralentit le développement ultérieur de la perception et du langage;
- minimiser les troubles émotifs et psychologiques qui sont susceptibles de se développer à la suite de difficultés de communication;
- minimiser l'angoisse des parents en leur offrant une aide personnelle concernant la condition de leur enfant, le plus tôt possible" (p. 10).

Alors que les enfants complètement sourds ou très durs d'oreille sont faciles à identifier, ceux dont le trouble auditif est modéré peuvent échapper à l'attention des parents ou des éducateurs. Kirk (1972) souligne ce danger :

"Often a child with a hearing loss of 40 to 50 decibels is not detected by parents or teachers since he hears conversational speech and probably learned to talk at an average age. Sometimes, deviant behaviour is not recognized as related to hearing loss but is attributed to other factors (such as low intelligence, emotional problems, lack of interest) which may not be pertinent" (p. 258).

Ainsi, on ne pourra fournir des soins adéquats qu'en connaissant exactement le comportement et le stade de développement des enfants affectés de troubles auditifs. Or, selon la littérature, un enfant de moins de trois mois ne peut se comporter de façon à permettre d'identifier avec clarté des difficultés auditives. Ainsi, un diagnostic de surdité chez un enfant de moins de trois mois ne pourrait se fonder que sur l'influence possible de facteurs héréditaires. Cependant, dès l'âge de trois mois, un enfant qui entend

normalement réagit de façon précise aux stimuli auditifs; toute réaction inusitée pourrait indiquer une perte auditive quelconque. Le CCDA (s. d.) suggère l'examen des réactions de l'enfant; tout écart du comportement normal devrait alors faire l'objet d'une attention spéciale :

- de la naissance à trois mois : sursaute à un tapement des mains (à une distance de 3 à 6 pouces);
- de trois à six mois : s'arrête de bouger ou de pleurer lorsqu'on l'appelle ou lorsqu'il entend un bruit inhabituel;
- de neuf à douze mois : se tourne vers la personne, qui l'interpelle (placée à distance de lui et hors de sa vue);
- à deux ans : s'exprime par de courtes phrases" (p. 5).

Le ministère de l'Éducation de l'Ontario (1971) présente une liste de troubles du comportement qui peuvent servir au dépistage des difficultés auditives chez les enfants en bas âge :

- "A. Mild or moderate hearing losses :
 1. ignores, confuses, or does not comply with directions;
 2. daydreams overly;
 3. educationally retarded;
 4. slight speech defect;
 5. "lazy";
 6. "dull";
- B. Signs suggestive of deafness in infants and young children :
 1. Hearing and comprehension of speech :
 - a) general indifference to sound;
 - b) lack of response to noises opposed to words.
 2. Vocalization and sound production :
 - a) monotonal quality;
 - b) indistinct;
 - c) lessened laughter;
 - d) meagre experimental sound plan and squealing;
 - e) vocal play for vibratory sensation;
 - f) head banging, foot stamping for vibratory sensation;
 - g) yelling, screeching to express pleasure, annoyance or need.
 3. Visual attention and reciprocal comprehension :
 - a) Augmented visual vigilance, attentiveness;
 - b) alertness to gesture and movement;
 - c) marked inattentiveness to play;
 - d) vehemence of gesture.
 4. Social rapport and adaptation :
 - a) subnormal rapport in vocal nursery games;
 - b) intensified preoccupation with things rather than persons;
 - c) inquiring sometimes confused or thwarted facial expressions;

- d) puzzled and unhappy episodes in social situations;
- e) suspicious alertness, alternating with cooperation;
- f) markedly reactive to praise and affection.

5. Emotional behaviour :

- a) tantrums to call attention to self or need;
- b) tensions, tantrums, resistances due to lack of comprehension;
- c) frequent obstinacies, teasing tendencies;
- d) irritability at not making self understood;
- e) explosions due to self vexations;
- f) impulsive and avalanche initiative" (p. 38-39).

Les parents qui comprennent la signification de tels comportements doivent immédiatement voir à ce que l'enfant reçoive les soins appropriés avant l'âge scolaire. Cependant, comme nous l'avons déjà suggéré, la probabilité d'un dépistage précoce augmente avec la sévérité de la perte auditive. C'est précisément pour cela que les enfants dont l'ouïe n'est affectée que légèrement ou modérément, ont peu de chances de recevoir les traitements appropriés. Et pourtant, Mactavish (1976) mentionne que :

"Even minor degrees of hearing loss have a detrimental effect on a child's school performance and his behaviour" (p. 13).

Ainsi, il revient à l'école de s'assurer que les enfants, qui y arrivent sans aucun diagnostic, soient identifiés le plus tôt possible. Bien que l'école ne puisse être tenue responsable de l'échec des parents à avoir détecté les troubles auditifs, elle doit tout de même voir à ce que les éducateurs ne répètent pas la même erreur. Les enseignants devraient alors pouvoir reconnaître les caractéristiques de développement et de comportement des enfants atteints de troubles auditifs.

Reynolds et Birch (1977) soutiennent que 5 principaux symptômes de troubles auditifs devraient retenir l'attention des enseignants :

- "1. The child appears to strain to hear, including leaning toward the speaker and cupping the ears with the hands.
- 2. The child asks to have comments and questions repeated and then gives the correct answers.
- 3. The child shows speech inaccuracies, especially dropping the beginnings and endings of words.
- 4. The child is frequently confused during discussions, even though evidently trying to participate.
- 5. The child has running ears, soreness, or aches and frequently rubs and scratches the outer ear canal" (p. 518).

Invariablement, la prééminence de ces symptômes dépendra du degré de surdité, de la capacité de l'enfant à comprendre le langage. Les tableaux I et II illustrent l'effet de divers degrés de surdité sur la capacité de compréhension de l'enfant.

TABLEAU 1

Effects and Prevalence Data for

Decibel loss in Speech Range	Degree of Handicap	Ability to Understand Speech	Prevalence in Percent
0-25	Insignificant	No difficulty	98,25
26-40	Slight	Problems with whispers or soft speech	1
41-55	Mild	Consistent pro- blems with normally loud speech	0,5
56-70	Marked	Loud speech often not understood	0,2
71-90	Severe	Understands only strongly magni- fied speech	0,05
91-	Extreme	Maximally amplified speech not understood	

Reynolds & Birch, 1977, p. 520.

TABLEAU II

Relationship of Degree of Impairment to Educational Needs

Average of the speech frequencies in better ear	Effect of hearing loss on the understanding of language and speech	Educational needs and programs
Slight 27 to 40 db	May have difficulty hearing faint or distant speech. May experience some difficulty with the language arts subjects.	Child should be reported to school principal. May benefit from a hearing aid as loss approaches 40 db (ISO). May need attention to vocabulary development. Needs favorable seating and lighting. May need lipreading instructions. May need speech therapy.
Mild 41 to 44 db (ISO)	Understands conversational speech at a distance of 3-5 feet (face to face). May miss as much as 50% of class discussions if voices are faint or not in line of vision. May exhibit limited vocabulary and speech anomalies.	Child should be referred to special education for educational follow-up. Individual hearing aid by evaluation and training in its use. Favorable seating and possible special class placement, especially for primary children. Attention to vocabulary and reading. Lipreading instructions. Speech conversation and correction, if indicated.
Marked 56 to 70 db (ISO)	Conversation must be loud to be understood. Will have increased difficulty in group discussions. Is likely to be deficient in language usage and comprehension. Will have limited vocabulary.	Child should be referred to special education for educational follow-up. Resource teacher or special class. Special help in language skills: vocabulary development, usage, reading, writing, grammar, etc...Individual hearing aid by evaluation and auditory training. Lipreading instruction. Speech conversation and correction. Attention to auditory and visual situations at all times.
Severe 91 db or more (ISO)	May hear some loud sounds but is aware of vibrations more than tonal pattern. Relies on vision rather than hearing as primary avenue for communication. Speech and language defective and likely to deteriorate.	Child should be referred to special education for follow-up. Full-time in special program for deaf children, with emphasis on all language skills, concept development, lipreading and speech. Program needs specialized supervision and comprehensive supporting services. Continuous appraisal of needs in regard to oral and manual communication. Auditory training with group and individual aids. Part-time in regular classes only for carefully selected children.

Kirk, 1972, p. 244-245.

En vue d'améliorer la justesse de l'identification à l'école, la connaissance des symptômes précités est particulièrement importante pour les enseignants du niveau primaire. Il va sans dire que cette connaissance pourrait diminuer largement le nombre d'enfants dont les troubles auditifs passent inaperçus. De plus, l'emploi de techniques ordinaires, pouvant être appliquées à l'école, pourrait également diminuer ce nombre. Kirk (1972) propose trois techniques ordinaires :

"Conversation at 20 feet;
Whisper tests;
Watch-trick tests" (p. 246).

Il faut également souligner que, pour fournir des programmes de qualité aux enfants souffrant de troubles auditifs, les systèmes scolaires doivent faire appel à des spécialistes. D'ailleurs, le ministère des Affaires sociales, Québec (1977) élabore la politique suivante :

"Une politique globale de réadaptation des enfants avec handicap auditif doit s'établir autour des pôles suivants :

- prévention des troubles auditifs;
- dépistage précoce;
- programme de réadaptation en bas âge;
- appareillage précoce et adéquat;
- scolarisation en milieu ouvert;
- formation du personnel" (p. 5)

Kirk (1972) suggère lui aussi un programme semblable :

"In fulfilling its responsibilities to hard-of-hearing children, the school has to : 1) identify those needing help; 2) see that they are adequately diagnosed and given whatever treatment is necessary; 3) provide an appropriate educational program" (p. 258).

Ainsi, tout programme de dépistage systématique des handicapés auditifs doit comporter des examens précis auxquels sera soumis l'enfant dès qu'il commence l'école, et qu'il répétera par la suite dans les années subséquentes. Ces examens, soutient Kirk, peuvent se réaliser au niveau individuel ou collectif et être administrés par une infirmière scolaire, un audiologiste ou un spécialiste de l'ouïe. Les étapes à suivre dans le dépistage se résument à :

- "1. Preliminary screening of children;
2. Threshold testing, and if hearing handicap is found, referral for otological examination;
3. Otological examination and medical treatment if indicated;
4. Audiological examination to include special tests and hearing-aid evaluation;
5. Psycho educational evaluation and special educational services" (Kirk, 1972, p. 259).

Le ministère des Affaires sociales du Québec (1977) recommande qu'un programme de dépistage systématique soit mis en oeuvre dès l'âge de 2 mois. Il indique aussi les genres d'examen qui devraient être réalisés aux âges suivants :

"0-2 mois, évaluation audiolologique; 6 mois, test d'orientation; 3 ans, test tonal à intensité fixe; 5 ans, test tonal à intensité fixe, tympano-impédancémétrie; 6-12 ans, idem, examen médical". (Synthèse des moyens de dépistage auditif p. 33).

E. Besoins éducationnels

L'éducation des enfants sourds et durs d'oreille doit surtout tenir compte des différents besoins éducationnels de chacun. Chez les sourds, il faut insister sur le développement du langage et de la communication, dimensions atrophiées en raison de l'absence des modalités sensorielles primaires à travers lesquelles elles se développent normalement. Comme Kirk (1972) le mentionne :

"without hearing, he does not naturally acquire speech and language; he does not acquire knowledge of other subject matters" (p. 274).

Leur déficience majeure n'est pas la surdité; toutefois, celle-ci les empêche d'apprendre les modes usuels de communication. Ainsi, l'éducation des sourds vise au développement d'autres modes de communication en s'appuyant sur d'autres sens et en utilisant au maximum l'audition résiduelle. Chez les durs d'oreille, il s'agit d'accroître et de bien employer l'audition limitée; on pourra ainsi se servir des canaux auditifs pour susciter la communication.

Plusieurs chercheurs ont exposé les caractéristiques de l'enfant affecté de troubles auditifs. Celles-ci déterminent ses besoins éducationnels et doivent servir de base à l'élaboration de programmes d'aide.

Il va de soi que le premier facteur qui influence le développement de l'enfant est, selon Kirk (1972), le degré de surdité. De plus, étant donné que plusieurs méthodes servent dans l'enseignement aux sourds et aux durs d'oreille, plus le trouble auditif est sérieux, plus le degré de retard sera accentué; par conséquent, plus approprié devra être le programme éducationnel (Reynolds and Birch, 1977). D'ailleurs, ceux dont la surdité est très prononcée s'exprimeront verbalement moins bien que ceux dont la perte auditive est plutôt modérée. On

constate cependant que les premiers exigeront, d'une part, un programme de réhabilitation plus intensif, et d'autre part, une aide technique plus spécialisée.

Le deuxième facteur qui influence les besoins éducationnels de ces enfants est l'âge de l'apparition du mal (Kirk, 1972). En effet, ce dernier ainsi que la période de développement du langage vont invariablement dicter l'étendue et le genre de programme requis. On sait que, généralement, plus la surdité apparaît tôt, plus le développement sera sérieusement perturbé.

C'est la nature du handicap auditif qui importe en troisième lieu parmi les facteurs qui influent sur les besoins éducationnels (Kirk, 1972; Reynolds et Birch, 1977). Le programme d'aide dépend de la cause du malaise; s'agit-il d'une perte de conduction osseuse, ou d'une perte neuro-sensorielle? De plus, les difficultés auditives diffèrent suivant la fréquence et l'intensité du son. L'intensité se réfère à la force relative (loudness) du son et elle contribue, comme nous l'avons déjà mentionné, à définir le degré de la perte auditive. La fréquence se réfère à la hauteur (pitch) du son; le degré de surdité de l'enfant dépendra de la difficulté qu'il éprouvera à détecter la hauteur (pitch) des sons. Ainsi, un individu peut facilement entendre tous les sons d'une certaine fréquence, alors qu'il ne pourra pas percevoir les sons d'une autre fréquence (Kirk, 1972). Reynolds et Birch (1977) soutiennent que la surdité de fréquence la plus sérieuse se situe dans les limites de la voix humaine, en conversation normale.

Le quatrième facteur qui vient influencer les besoins éducationnels est le développement intellectuel de l'enfant. Reynolds et Birch (1977) ainsi que Kirk (1972) semblent suggérer que les enfants possèdent des niveaux intellectuels différents. Cette variabilité intellectuelle oblige une prise de conscience du potentiel cognitif de l'enfant avant d'établir ses besoins éducationnels. Il va de soi que les plus doués exigeront des programmes d'un rythme équivalent à celui d'une classe régulière.

Enfin, le cinquième facteur, qui ne manque pas d'importance, est la nature et la quantité de la stimulation fournie à l'enfant (Reynolds et Birch, 1977). L'examen de l'environnement familial de l'enfant peut permettre d'identifier des domaines qui exigent une plus grande attention ainsi que

certaines éléments du développement dont un programme d'aide devra tenir compte.

Pour bien répondre aux besoins des sourds et des durs d'oreille, Caccamise (1974) soutient que tous ceux qui participent à des programmes dans ce domaine doivent connaître et comprendre six notions fondamentales : l'enfant affecté de troubles auditifs,

- 1) est doué d'une intelligence semblable à ses collègues;
- 2) peut vivre une existence aussi significative et aussi riche socialement que les autres;
- 3) peut s'acquitter aussi bien que les autres des tâches relatives à son âge;
- 4) peut développer, lui aussi, des problèmes de personnalité;
- 5) peut se voir affecté de trois sortes de difficultés d'apprentissage uniques :
 - une compréhension du langage comme moyen de communication et comme moyen d'autres apprentissages;
 - une communication efficace avec les autres personnes peut présenter de nombreux problèmes;
 - un apprentissage de moyens en vue de substituer l'utilisation d'autres sens à l'audition; et
- 6) enfin, soutient Caccamise, il peut surmonter chacun des problèmes mentionnés.

Moore (1970) suggère que les éducateurs d'enfants affectés de troubles auditifs devraient insister sur cinq points précis :

- "1. Optimal period : Importance of first three to four months of life to language acquisition.
2. Teaching and learning : Importance of the teachers' role as that of learning facilitator.
3. Language and speech : Importance of making a clear distinction between speech and language.
4. Performance and competency : Importance of attacking the problem of inappropriate utterances at the deep structure level.
5. Imitation and expansion : Importance of good mother-child communication" (p. 42).

Les auteurs du Projet NEED (Bitter, 1974, Noher, 1973, Paul, 1972) ont développé un ensemble de services qui mettent en lumière les aspects les

plus importants dans ce genre d'enseignement. Ils fournissent aussi des directives pour l'organisation et l'administration de programmes spécialisés.

Plus spécifiquement, l'éducation des durs d'oreille devrait surtout mettre l'emphasis sur les fonctions auditives; celle des sourds devrait viser à une compensation par d'autres fonctions sensorielles. Cependant, la revue de la littérature révèle que certains éléments des approches éducatives sont communs aux deux situations, à savoir : l'emphasis sur la présentation de matériel retenant l'attention visuelle; l'utilisation d'instruments qui amplifient au maximum l'audition résiduelle; et la très grande importance accordée au développement de la parole et du langage.

Kirk (1972) prétend que l'éducation des durs d'oreille comporte quatre phases : l'apprentissage de l'emploi de prothèse auditive; l'entraînement auditif; la lecture labiale (lip reading); et la correction du langage.

Le même auteur souligne que le choix d'une méthode d'éducation des sourds demeure hautement controversé. La littérature indique que les éducateurs diffèrent d'opinion quant à la méthode, orale ou manuelle, la plus efficace pour promouvoir le développement d'un système de langage, et laquelle permet le mieux d'entraîner un enfant à bien s'adapter au monde de l'audition.

La méthode orale exige que l'enfant puisse lire les lèvres (lip reading). Cette méthode est la seule qui permet la communication avec d'autres personnes (Reynolds et Birch, 1977). La méthode manuelle comprend :

"1) the language of Signs, a language system consisting of formalized movements of the hands to express thoughts, and 2) fingerspelling using the manual alphabet" (Kirk 1972, p. 262).

Des variantes de ces deux méthodes de base ont été développées et elles font appel à des éléments de l'une ou de l'autre. La communication totale, par exemple, exige que l'enfant apprenne tous les éléments de ces 2 méthodes (Reynolds et Birch, 1967). L'approche combinée marie la méthode orale à l'emploi du langage digital. L'approche simultanée fait à la fois appel à l'emploi de la communication orale, du langage digital et du langage par signes. De cette façon, certains mots sont exprimés par langage digital et d'autres par des

signes. Selon Kirk (1972), les trois méthodes les plus fréquemment utilisées sont l'approche orale, l'approche combinée et l'approche simultanée.

Quelle que soit l'approche utilisée, la littérature indique clairement une volonté d'acheminer les enfants affectés de troubles auditifs vers des classes régulières. McConnell (1973) écrit que :

"The rapid increase in early detection, infant and preschool education, and day-class programs of higher quality, should result in greater numbers of children able to join the regular education system" (p. 379).

Les possibilités offertes dans ce domaine peuvent varier de l'intégration complète dans les classes régulières à un traitement ininterrompu en résidence. Il n'en demeure pas moins que le niveau d'intégration le plus approprié aux besoins de l'enfant dépend avant tout de plusieurs éléments dont, le degré de surdité, l'étendue des effets que cette perte auditive a entraîné sur le développement, l'âge lors de l'identification du trouble auditif ainsi que l'accessibilité des appareils et du personnel qualifié en milieu scolaire.

2. LES DIFFICULTÉS D'APPRENTISSAGE

Introduction

Dans cette section, nous tentons de présenter les théories et les connaissances actuelles concernant les difficultés d'apprentissage. Cet exposé inclut les ambiguïtés possibles ainsi que les éléments controversés sur le sujet.

C'est en tenant compte de six composantes que les approches de définition des difficultés d'apprentissage sont discutées. Ainsi, il est question des dimensions intellectuelle, fonctionnelle, académique, contradictoire, neurologique et exclusive. Il va de soi que les spécialistes peuvent utiliser toute combinaison de ces six composantes.

Il reste que la difficulté de définir adéquatement les difficultés d'apprentissage vient colorer d'autres domaines éducatifs. En effet, les statistiques de fréquence de ces difficultés sont très inconsistantes; leurs causes sont parfois mal comprises; les techniques diagnostiques souffrent d'invalidité et une approche éducative clairement efficace n'existe pas encore.

Tout cela démontre nettement l'urgent besoin de recherches dans ce domaine; celles-ci permettraient d'établir les causes précises des difficultés d'apprentissage et de développer, avec beaucoup plus de précision, des critères de définition de ces difficultés.

À cette fin, les enseignants doivent évaluer très attentivement chaque enfant qui n'apprend pas, et modifier soigneusement l'environnement (le programme, la méthode d'enseignement, les facteurs motivants) pour que l'on puisse discerner un progrès, quelle qu'en soit la forme. Les pages qui suivent visent à aider l'éducateur à comprendre les problèmes qu'affronte l'enfant. On y trouvera également des éléments qui encourageront les enseignants à apporter des solutions pédagogiques.

A. Définition et classification

La définition des difficultés d'apprentissage la plus répandue et la plus influente nous vient du National Advisory Committee on Handicapped Children (NACHC, 1968) :

"Children with specific learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in written or spoken language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, dyslexia, developmental aphasia, etc...

They do not include conditions which are due primarily to visual hearing or motor handicaps, to mental retardation, emotional disturbance, or to environmental deprivation."

Depuis que cette définition a été présentée par le NACHC, beaucoup d'autres ont été avancées. Cependant, aucune n'a reçu autant d'appui que celle du NACHC. Plutôt que de présenter les différentes approches d'une définition des difficultés d'apprentissage, on suggère d'exprimer les diverses positions des spécialistes dans ce domaine par une combinaison des six composantes suivantes :

1. La composante intellectuelle : le plus souvent, les définitions mentionnent qu'un enfant affecté de troubles d'apprentissage possède une intelligence normale ou supérieure.
2. La composante fonctionnelle : on veut ici insister sur le fait que les difficultés d'apprentissage résultent d'un désordre ou d'une déficience des fonctions.
3. La composante académique : pour plusieurs spécialistes ce sont les difficultés académiques rencontrées par l'enfant qui importent le plus. Voilà ce que devrait d'abord souligner la définition des difficultés d'apprentissage. D'autres théoriciens utilisent cette composante pour montrer la relation causale entre les désordres fonctionnels et le rendement académique insuffisant.

4. La composante différentielle : l'enfant qui éprouve des difficultés d'apprentissage est communément défini comme celui dont le rendement actuel n'atteint pas son rendement potentiel.
5. La composante neurologique : l'emploi de cette composante est très controversée. D'une part, certains auteurs font appel à l'étiologie du système nerveux pour définir les difficultés d'apprentissage; d'autre part, certains protestent et soutiennent qu'à moins d'une identification claire, les causes neurologiques n'ont rien à voir avec la définition des difficultés d'apprentissage.
6. La composante d'exclusion : bien que la pertinence de cette composante ne fasse pas l'unanimité pour définir les difficultés d'apprentissage, elle permet d'assurer que les problèmes d'apprentissage, qui découlent d'autres handicaps, ne sont pas confondus avec des difficultés d'apprentissage. Essentiellement, cette composante correspond à un diagnostic par élimination; la difficulté d'apprentissage n'est acceptée qu'une fois tous les autres handicaps éliminés.

B. Fréquence

La fréquence des difficultés d'apprentissage, telle que citée dans la documentation, varie beaucoup. Cela résulte des difficultés de définir adéquatement ce désordre et du manque de critères fonctionnels précis qui permettent de parler des difficultés d'apprentissage. Selon la rigidité ou la souplesse de la définition, on estime habituellement la fréquence des difficultés d'apprentissage entre 1 et 28 pour cent.

Selon le NACHC (1968) :

"The total number of children involved cannot be accurately determined until more adequate diagnostic procedures and criteria have been developed. The disorders may range in degree from mild to severe, while the milder degrees of learning difficulties may be corrected by the classroom teacher, the more severe cases require

special remedial procedures. A conservative estimate of the latter group would include from 1 to 3 percent of the school population" (p. 14).

Même si les opinions sont ici très partagées, la majorité des chercheurs (Kirk, 1972) sont d'accord avec les données du NACHC et proposent que l'incidence des difficultés d'apprentissage se situe entre 1 et 3% par rapport aux exigences des programmes de l'enfance en difficulté.

Le U.S. Office of Education (1974) et le ministère de l'Éducation de l'Ontario (1971) donnent une fréquence d'environ 1%. Cette estimation semble bien refléter la proportion des écoliers qui nécessitent des services éducatifs spéciaux.

C. Causes

Les causes des difficultés d'apprentissage semblent beaucoup plus difficiles à comprendre que celles des autres troubles de l'enfance. Bien que plusieurs auteurs - Cruickshank, 1977; Kephart, 1971 - croient fermement qu'il existe des relations causales directes entre les difficultés d'apprentissage et les dysfonctions neurologiques, cette hypothèse demeure surtout théorique.

Des recherches appuient, toutefois, l'hypothèse énoncée. En effet, certaines études ont identifié des irrégularités électro-encéphalographiques (EEG) chez les enfants qui ont des difficultés d'apprentissage (Laxton, 1976; Satterfield et al., 1973; Shields, 1973). D'autres études ont montré une dysfonction de l'hémisphère cérébral (Bryan and Bryan, 1975; Gallin, 1976), une immaturité corticale (Bakker and de Wit, 1977), et d'autres facteurs neurologiques qui caractérisent les enfants affectés de troubles d'apprentissage. Il faut cependant ajouter qu'en dépit d'une démonstration convaincante du lien des causes neurologiques, la recherche n'a pu, jusqu'à maintenant, clarifier avec précision la nature complexe et les causes de ce phénomène.

Pour cette raison, on accepte normalement que l'enfant qui éprouve des difficultés d'apprentissage souffre, dans une certaine mesure, de dysfonction neurologique, même en l'absence de preuves irréfutables. De plus, la

confirmation d'un désordre neurologique ne constitue pas un prérequis au diagnostic de difficultés d'apprentissage.

Plusieurs chercheurs ont proposé des théories visant à expliquer la relation qui existe entre les difficultés d'apprentissage et les facteurs neurologiques. C'est le cas de Doman et al (1967), et d'Ayres (1973), qui soutiennent que la difficulté d'apprentissage représente une rupture du développement séquentiel à travers lequel un individu doit progresser pour parvenir à une organisation neurologique totale. Ceux qui souscrivent à cette approche appartiennent au groupe des théoriciens du "retard" (delay); ceux-ci supposent, en effet, que l'enfant qui éprouve des difficultés d'apprentissage accuse un retard de maturation cérébrale.

Ceux qui s'opposent à cette approche appartiennent au groupe de théoriciens de la "déficience" (deficit) parce qu'ils croient que l'enfant qui éprouve des difficultés d'apprentissage a subi des dommages cérébraux (lésions cérébrales qui empêchent l'enfant intelligent d'apprendre normalement). Le terme "minimal brain dysfunction" (MBD), Clements 1966, qualifie cette deuxième approche. Comme le terme MBD l'indique, il s'agit bel et bien d'une dysfonction cérébrale minime qui affecte légèrement la capacité d'apprendre même si l'intelligence dans son ensemble demeure intacte.

Les tenants de ces deux approches - les théoriciens du "retard" et de la "déficience" partagent cependant l'opinion que ces ruptures cérébrales - responsables des difficultés d'apprentissage - sont causées par des complications prénatales, périnatales ou postnatales. Des études, dont celles de Long, 1977; Mednick, 1977; Smith et Wilborn, 1977, ont décrit l'historique du développement d'enfants affectés de difficultés d'apprentissage et ont trouvé une fréquence inhabituelle de facteurs divers qui contribuent à cette situation. Nichols (1977) présente dix de ces facteurs : la toxémie, la fièvre, l'usage de tabac pendant la grossesse, les complications placentaires, l'emploi de forceps, l'accouchement par le siège, le faible poids à la naissance, les anomalies néo-natales et les difficultés respiratoires prononcées.

Les études de Cott, 1972, 1974, Hawley et Buckley, 1974, Pauling, 1968, soutiennent par contre que des facteurs biochimiques nuisent à l'appren-

tissage. Dans ce contexte, les difficultés d'apprentissage sont liées à des additifs alimentaires, (Feingold, 1975), à des privations nutritives, (Birch et Gussow, 1970), à des réactions allergiques (Crook, 1974) et à des dysfonctions génétiques neurochimiques (Rossi, 1972).

D. Identification et évaluation

Dans le domaine de la recherche éducative et neurologique, on doit dire que depuis quelques années, on a beaucoup porté attention au dépistage précoce des difficultés d'apprentissage.

Bien qu'on ne puisse encore diagnostiquer ce désordre dès la jeune enfance, plusieurs méthodes permettent de reconnaître les nouveaux nés qui présentent un "risque élevé" à cet égard. Quiros (1976), croit qu'une bonne partie de la population de ces enfants sont affectés : "with vestibular (inner ear) disorders and related postural disturbances". Ainsi, ce chercheur a présenté des moyens pour identifier ce désordre chez les nouveaux-nés en vue de sensibiliser les parents et les éducateurs aux symptômes des difficultés d'apprentissage. Autrement, les enfants présentant un "risque élevé" ne peuvent être dépistés qu'à la suite de difficultés survenant pendant la grossesse ou à la naissance.

Le Brookline Early Education Project (BEEP, Pines, 1976) cherche à identifier les enfants de 8 à 18 mois qui pourraient éventuellement souffrir de difficultés d'apprentissage et à réaliser un programme d'intervention pendant les années critiques du développement.

Des méthodes de dépistage ont également été élaborées par Graft 1975, pour les jardins d'enfants (3 ans).

Dans la plupart des cas, cependant, l'enfant affecté de difficultés d'apprentissage arrive au jardin sans que celles-ci n'aient été identifiées. Même si quelques troubles de comportement ont déjà attiré l'attention des parents, le fait que l'enfant possède une intelligence normale ou supérieure a amené les parents à ne pas croire à la présence de quelque handicap.

C'est pour cela que la littérature insiste sur l'importance d'un programme de dépistage précoce à l'intérieur de l'école. Le projet SEARCH (Silver et Hagin, 1976) est un exemple, parmi d'autres, d'un instrument récemment conçu pour dépister les difficultés d'apprentissage chez les enfants qui fréquentent encore le jardin. Et même en faisant abstraction des programmes de dépistage au jardin, les enseignants des premières classes du primaire devraient pouvoir reconnaître les caractéristiques des difficultés d'apprentissage et utiliser les techniques d'évaluation prévues à cette fin.

Les caractéristiques qui retiennent fréquemment l'attention, parce qu'elles exigent une évaluation plus poussée, s'appliquent à des enfants d'une habileté normale ou supérieure : l'hyperactivité; les problèmes d'attention; les problèmes moteurs (coordination déficiente, désordres tactiles kinesthétiques); les difficultés de perception visuelle et auditive; les problèmes du langage; les mauvaises habitudes de travail; les problèmes socio-émotifs; les difficultés d'orientation (spatiale et temporelle) ainsi que les difficultés académiques (Fass, 1976).

Les enseignants qui peuvent reconnaître la signification de ces caractéristiques peuvent alors procéder à une évaluation plus approfondie de l'enfant en utilisant différentes données techniques ainsi que des méthodes d'observation ad hoc. Parmi les méthodes les plus utilisées on mentionne particulièrement la "High's Pupil Behaviour Rating Scale" (dans Gearheart, 1977); les "trial lessons" (Rowell et Natchey, 1971), et l'"Informal Reading Inventory" (Johnson et Kress, 1965).

Une fois ses difficultés d'apprentissage identifiées, l'enfant est habituellement référé à des personnes qualifiées pour conduire une évaluation plus exhaustive. À ce stade, l'évaluation vise à déterminer la signification psycho-éducationnelle du problème ainsi qu'à déterminer le programme d'aide le plus approprié aux besoins de cet enfant affecté de difficultés d'apprentissage.

À cet effet "a generally accepted diagnostic evaluation for individual students should consist of: an educational assessment, an intellectual evaluation, and a medical assessment identifying areas which might affect learning" (Ontario Ministry of Education, 1977).

Les tests d'intelligence, que ce soient celui de Binet ou du WISC, permettent de déterminer quantitativement la capacité intellectuelle de l'enfant et de s'assurer que le problème de l'enfant ne résulte pas d'une déficience intellectuelle.

Selon la documentation, la caractéristique qui différencie l'enfant dont le Q.I. est faible de l'enfant affecté des difficultés d'apprentissage est la suivante : l'apprentissage de l'enfant dont le Q.I. est faible sera généralement déficitaire dans tous les domaines alors que celui de l'enfant affecté de difficultés d'apprentissage ne le sera que dans un domaine particulier. Ainsi, un enfant de faible Q.I. obtiendra de piètres résultats dans tous les sous-tests des tests d'intelligence normalisés, contrairement à l'enfant qui éprouve des difficultés d'apprentissage dont le rendement sera très inégal. On remarque alors que l'enfant affecté de difficultés d'apprentissage obtient, avec régularité, de faibles résultats dans certains domaines, alors que dans d'autres, il se classe dans la moyenne ou au-dessus.

La notion de déficience représente alors un des principaux éléments du diagnostic courant. Comme Reynolds et Birch (1977) l'expliquent :

"The basic concept is this : some presumed measure of expectancy usually mental age or age-grade level, is contrasted with pupil's actual achievement, such as reading grade level as measured by a norm referred test. If the actual achievement is substantially below expected achievement (two grade levels is a common demarcation). The discrepancy has been said to denote a...learning disability" (p. 350).

Le degré de déficience peut s'exprimer à partir de formules variées (i.e. Bond et Tinker, 1967; Harris, 1970; King, 1970; Myklebust, 1968) ou selon l'interprétation des résultats des sous-tests de tests comme ceux de l'ITPA (Kirk et Kirk, 1971) ou du WISC (Bannatyne, 1974). Ces deux méthodes permettent le diagnostic des difficultés d'apprentissage, c'est-à-dire : le rendement de l'enfant n'atteint pas son potentiel; les habiletés mentales de l'enfant varient.

Le processus d'évaluation recherche habituellement des données qui indiqueront que l'enfant possède un ensemble inconsistant de forces et de faiblesses. C'est alors qu'il devient impérieux de pousser d'avantage l'évaluation afin de bien établir les domaines déficients de l'enfant. À cet effet, on évalue surtout le rendement dans des tests de rendement, comme, par exemple, le

"Wide Range Achievement Test". Des tests de nature perceptuelle renseignent davantage sur les causes de la déficience intellectuelle et permettent de mieux comprendre la nature de l'apprentissage déficient de l'enfant. Ce sont surtout Sabatino et Foster (1974, 1976), Chalfant et Schefflin (1969 et Minstroff et al (1972) qui ont développé des stratégies diagnostiques permettant d'identifier les processus déficitaires dont résultent les difficultés d'apprentissage.

Finalement, un examen neurologique vient déterminer si les difficultés d'apprentissage de l'enfant sont accompagnées de signes identifiables de désorganisation cérébrale (anomalies encéphalographiques; signes bénins). Bien qu'un rapport négatif ne vienne pas nier la présence possible de troubles d'apprentissage, la découverte de facteurs neurologiques vient appuyer le diagnostic premier et facilite l'identification des causes des difficultés d'apprentissage.

E. Besoins éducationnels

Quel que soit l'âge de l'enfant ayant des difficultés d'apprentissage, on doit d'abord se soucier de fournir à l'enfant le programme éducationnel approprié.

Dans certains systèmes scolaires, l'accessibilité aux services spécialisés s'étend même au niveau du pré-jardin. Le Conseil des écoles publiques de Fargo (1976), par exemple, offre un programme d'aide au niveau du pré-jardin. Ce programme touche six secteurs : l'art du langage, les mathématiques, les sciences, la santé, le développement des habiletés motrices et les expériences sociales. Chacun de ces secteurs s'articule autour d'habiletés précises qui doivent être identifiées par les enseignants du jardin et des premières classes.

Selon l'importance des difficultés d'apprentissage, les programmes mis en place requièrent soit le retrait partiel de la classe régulière, soit le retrait total en vue de traitements en résidence. Goodman et Man (1976) expliquent qu'en milieu scolaire "good programs offer a continuum of services ranging from the self-contained classroom to total mainstreaming" (p. 11). De plus, ils ajoutent que "by far the most appealing service model is the resource room coupled with modification of the regular classroom" (p. 96).

Les méthodes d'enseignement des enfants affectés de difficultés d'apprentissage sont aussi nombreuses et variées que le sont les définitions de ce même phénomène. La revue de la littérature identifie trois approches principales, chacune d'elle correspondant aux théories exprimées par rapport aux causes des désordres. Pour les besoins de la présente revue de la documentation, nous qualifierons ces approches comme suit : physiologiques, psychologiques, éducatives.

L'approche physiologique tient des théories qui soutiennent que les difficultés d'apprentissage résultent de désordres neurologiques ou métaboliques. Les tenants de cette approche insistent pour que la reconnaissance de ces facteurs soit respectée dans la définition et l'évaluation des troubles d'apprentissage.

À l'intérieur de cette catégorie générale, celle qui attribue les difficultés d'apprentissage à des causes physiologiques, on distingue trois approches différentes.

Premièrement, les "neurological delay theorists" comme Doman et al (1967) ainsi que Ayres (1973), disent que les difficultés d'apprentissage découlent d'un retard du développement cérébral. Il y a donc interruption, à quelque niveau, du développement neurologique. En raison de cela, ils proposent des stratégies éducatives qui viseraient à rétablir le processus de développement neurologique normal. La théorie du "patterning" de Doman et al (1967) est orientée dans cette direction.

Deuxièmement, les "neurological deficit theorists" (Millichap, 1977) croient que les anomalies qui causent les difficultés d'apprentissage sont telles qu'elles ne peuvent être traitées et que l'éducation doit s'attaquer directement aux symptômes des troubles neurologiques. En d'autres mots, la déficience organique est irréversible et seul un entraînement adéquat peut redonner au cerveau un fonctionnement normal.

Troisièmement, il y a ceux qui soutiennent que des facteurs métaboliques causent les difficultés d'apprentissage. Cott (1972, 1974) suggère que les processus mentaux sont affectés par l'environnement orthomoléculaire du

cerveau. Dans le cas des difficultés d'apprentissage, Cott (1972, 1974) suggère que les processus mentaux sont affectés par l'environnement orthomoléculaire du cerveau. Dans le cas des difficultés d'apprentissage, une nutrition improprie rompt l'équilibre biochimique de cet environnement, nuisant ainsi à l'apprentissage. Ce même théoricien soutient qu'un traitement vitaminique peut rétablir l'équilibre biochimique et éliminer les causes des difficultés d'apprentissage. Pour sa part, Feingold (1975), attribue l'hyperactivité, fréquemment rencontrée chez ceux qui éprouvent des difficultés d'apprentissage, à l'usage d'additifs alimentaires.

L'exemple de l'hyperactivité permet d'illustrer les divergences des trois approches présentées quant il s'agit de remédier aux difficultés d'apprentissage. Ainsi, les théoriciens du "déficit" verraient l'hyperactivité comme un échec pathologique du contrôle des pulsions. Bien que la pathologie elle-même ne puisse être écartée, le contrôle des pulsions peut s'obtenir par le biais des techniques de modification du comportement ou par l'usage de drogues. Les théoriciens du "retard" suggèrent que l'hyperactivité résulte d'un développement retardé du contrôle pulsionnel. Le traitement consiste alors à accélérer le développement neurologique au moyen d'exercices moteurs qui dépassent le niveau normal d'acquisition du contrôle des pulsions. Les tenants de la théorie métabolique, qui attribuent l'hyperactivité à un déséquilibre biochimique, recommandent des traitements à base de vitamines ou du contrôle de l'alimentation.

Dans la catégorie des approches psychophysiologiques, on retrouve toutes celles qui insistent beaucoup sur le rapport qui existe entre les processus psychologiques inhérents à l'apprentissage et les systèmes sensoriels à travers lesquels l'information est acquise. Selon cette interprétation, les difficultés d'apprentissage traduisent une dysfonction neuro-sensorielle (i.e. tactile, auditive, visuelle, kinesthétique). Pour les tenants de la théorie psychophysiologique, l'étiologie neurologique ne se rapporte qu'aux processus psychologiques. Ces théoriciens insistent plutôt sur l'identification des processus déficients et sur la planification d'un programme d'aide adéquat.

Selon l'orientation théorique de l'auteur, ce sont les divergences quant aux modalités sensorielles qui créent le plus de désaccord sur la question

des difficultés d'apprentissage. Kephart (1971), soutient que "It is logical to assume that all behaviour is basically motor, that the prerequisites of any kind of behaviour are muscular and motor responses" (p. 94). Pour cette raison, Kirk dit que l'éducation de l'enfant affecté de difficultés d'apprentissage devrait comporter des activités d'entraînement moteur.

Frostig (1970, 1972, 1973) croit que les difficultés d'apprentissage résultent d'un désordre d'une des cinq fonctions de perception visuelle à savoir : la coordination visuo-motrice, la configuration, la perception de base, la constance des formes, la position dans l'espace et les relations spatiales. En utilisant le DTUP (Frostig et al, 1964) pour identifier la déficience, Frostig recommande l'exercice des régions affectées.

Bien que l'importance des processus d'apprentissage varie, toutes les théories de ce groupe définissent habituellement les difficultés d'apprentissage par rapport au processus déficient. D'ailleurs, Reynolds et Birch (1977) expliquent que "remediation is aimed at pinpointing and then eliminating or ameliorating the presumed deficits through developmental instruction that matches specific teaching prescriptions with specific deficits" (p. 360). D'autres théoriciens recommandent plutôt que l'éducation prenne avantage des processus intacts de l'enfant : "for example, when auditory processes are weak or deficient, visual learning is emphasized" (Goodman et Mann, 1976, p. 27).

Les approches multisensorielles sont également classées dans la catégorie des théories psycho-physiologiques. Les tenants de cette approche proposent que la solution des difficultés d'apprentissage ne se limite pas à l'éducation d'un seul sens. En effet, parce que le trouble d'apprentissage représente une rupture généralisée des processus d'apprentissage, et parce qu'aucun sens ne fonctionne indépendamment des autres, l'éducation devrait viser à restaurer l'organisation inter-sensorielle. Cela tient surtout au fait que la stimulation de plusieurs sens renforce l'apprentissage.

La méthode VAKT (Visual-Auditory-Kinesthetic-Tactual) développée d'abord par Fernald en 1943, constitue le système d'enseignement multisensoriel le plus complet. Suivant cette méthode, l'enfant apprendrait un nouveau mot en le voyant, en l'entendant, en le prononçant, en le traçant, etc...

Des variantes de la technique VAKT ont été par la suite mises au point par Blau et Blau (1969) et par Gillingham et Stillmann (1966).

La troisième catégorie d'approche à l'éducation de ceux qui ont des difficultés d'apprentissage comprend toutes les théories qui dénoncent l'importance des données étiologiques dans l'élaboration de programmes éducatifs. Les tenants de ces théories insistent avant tout sur le faible rendement académique de l'enfant. En d'autres mots, même si l'enfant ne peut lire à cause de désordres visuels ou de dommages au système nerveux central, il importe avant tout qu'il apprenne à lire.

L'éducation portera alors directement sur les domaines académiques déficients ou sur le renforcement des secteurs défavorisés de l'enfant.

Ysseldyke et Salmia (1974), par exemple, adoptent une "task-analysis approach to teaching". Ces auteurs proposent l'évaluation des habiletés académiques et un enseignement qui vise à permettre à l'enfant d'atteindre un certain niveau de rendement académique. On insiste alors sur certaines habiletés et sur leur intégration à des comportements complets (Lerner, 1976).

Finalement, les approches mises à jour pour l'éducation de ceux qui ont des difficultés d'apprentissage sont nombreuses et très variées. Mais aucune n'apparaît encore significativement supérieure à une autre. Pour cette raison, les conseils à suivre dans le développement de stratégies d'enseignement sont rares; ainsi, peu de principes d'enseignement peuvent s'étendre à tous les cas de difficultés d'apprentissage. Pour l'instant, et jusqu'à ce que les difficultés d'apprentissage soient clairement comprises, les éducateurs ne peuvent suivre avec une certaine sécurité que l'approche de l'enseignement individuel.

3. LES TROUBLES DE LA PAROLE ET DU LANGAGE

A. Définition et classification

B. Causes

Lorsque l'on veut définir et classer les troubles de la parole et du langage, une difficulté majeure se présente, à savoir le chevauchement de ces désordres sur d'autres catégories d'exceptions. La documentation indique d'ailleurs clairement que les troubles d'élocution et de langage résultent d'autres handicaps. La paralysie cérébrale et la surdité constituent de tels handicaps, où l'enfant devra surtout surmonter des problèmes d'élocution et de langage.

Pour cette raison, toute tentative de définir et de classer les troubles de la parole et du langage doit tenir compte des causes de ces mêmes désordres.

Parmi les définitions rencontrées dans la documentation, on retrouve celles-ci :

"Speech that is so different from the speech of others that it calls attention to itself, interferes with communication, or causes emotional and/or social maladjustment arising from problems of articulation, rhythms, voice tone, or language usage."

(Ontario Ministry of Education, 1971; p. 25).

"Defective speech attracts more attention to the speech sounds and accompanying mannerisms than to the content of what the speaker is saying."

En vue de classer et de définir davantage ce genre de handicap, on reconnaît généralement deux types de troubles du langage et de la parole : des désordres d'origine organique ou physiologique; des désordres d'origine inorganique ou dus au développement. Reynolds et Birch (1977) proposent une classification médicale : les désordres dus à l'endommagement du système nerveux central (cerveau), soit une aphasie du développement; les désordres provenant d'une paralysie cérébrale; les désordres provenant d'un palais fendu, ou d'une lèvre fendue; les désordres dus à des difformités

structurales; les désordres résultant d'un développement cognitif lent (arriération mentale); et enfin, le bégaiement (lié à des conditions psychiatriques ou neurologiques) (p. 486). De plus, ces troubles de la parole et du langage peuvent revêtir la forme de défauts d'articulation (omission de certains sons, substitution d'un son pour un autre, distorsion de sons) ou de problèmes vocaux (reliés à la qualité, à la flexibilité, au volume, à la hauteur de la voix).

Pour sa part, Kirk (1972) place tous les types de troubles de la parole et du langage - qu'il soient physiologiques, dus aux développements psychologiques, culturels ou environnementaux - dans une seule classification. Voici comment se présentent les catégories et les sous-catégories de Kirk :

- "1. Disorders of articulation :
 - 1) substitutions
 - 2) omissions
 - 3) distortions and
 - 4) additions of sounds
2. Disorders of voice
 - 1) vocal quality :
 - a) phonation or the production of sounds,
 - b) resonance or the direction of the sounds in voice placement : 2 types : hypernasal speech and denasal speech.
 - 2) vocal pitch
 - 3) loudness/vocal intensity
3. Stuttering
4. Retarded speech development
5. Cleft palate :
 - 1) cleft of lip tissue : medial, unilateral or bilateral
 - 2) cleft of the lip and hard palate
 - 3) cleft of the soft palate alone
 - 4) cleft of the uvula
 - 5) submucous cleft of the palate
6. Cerebral palsy
7. Impaired hearing
8. Aphasia and related disorders"

Ces huit catégories de troubles de la parole et du langage forment la classification la plus utilisée par les éducateurs dans le domaine de l'enfance en difficulté. D'autres auteurs, dont Johnson (1967), Hervett et Forness (1977), Launay et Borel-Maisonny (1975), Van Riper (1972) acceptent la classification

de Kirk et croient que cette dernière, bien que flexible, présente de façon exhaustive les troubles de la parole et du langage. C'est pour cette raison, qu'une fois de plus, la classification de Kirk servira à présenter les définitions de chaque type de ces désordres.

En général, les défauts d'articulation se réfèrent à quatre caractéristiques spécifiques. Ainsi, Kirk (1972), Reynolds et Birch (1977), ainsi que le ministère de l'Éducation de l'Ontario (1971), suggèrent :

- 1) omission de certains sons, comme "e ou aime";
- 2) substitution d'un son pour un autre, comme "dans le fifoir";
- 3) distorsion de sons, comme "achez" pour "assez";
- 4) addition de sons, comme "voulez-a vous-a".

Selon Kirk (1972),

"The articulatory mechanism is part of an intricate speaking system, any part of which may show abnormalities of structure or function" (p. 82).

Ainsi, Kirk croit que des facteurs physiologiques sont d'abord causes de ce genre de défauts du langage. Il souligne cependant qu'en l'absence de défaut structural apparent, l'étiologie pourra être un environnement défavorisé, une enfance non protégée, des troubles émotifs, le bilinguisme, une maturation lente ou un manque d'éducation à la maison.

Par contre, Reynolds et Birch (1977), suggèrent que :

"The errors themselves seldom result from physiological factors. Instead, they appear to be developmental in origin..." (p. 494).

Alors que les troubles d'articulation sont liés à la formation des sons, les désordres vocaux se réfèrent à la production de sons dans le larynx, (Kirk, 1972). Ainsi définie, la qualité vocale se réfère à des "voices that are so nasal, harsh or breathy that they interfere with communication" (Reynolds et Birch, 1977; p. 497), ou, selon Kirk (1972), à la phonétique et à la résonance des sons. Les problèmes de hauteur vocale se définissent par rapport à la hauteur normale, en fonction de l'âge. Les défauts d'intensité de la voix sont caractérisés par un langage trop doux ou trop fort.

En ce qui a trait à l'étiologie, les auteurs ne s'accordent pas quant à savoir si ces désordres résultent de facteurs physiologiques ou de développement.

Le bégaiement est défini comme : "a pattern of speaking in which rhythms of speech are disrupted or broken by excessive or inappropriate prolongations and/or repetitions of sounds, syllables, words, or parts of sentences, usually accompanied by struggle and avoidance behaviour" (Kirk, 1972, p. 87). Launay et Borel-Maisonny (1975) suggèrent que "le langage est précipité, désordonné, entrecoupé d'arrêts; il est souvent incompréhensible" (p. 370). Lorsqu'il est question de l'étiologie du bégaiement, le désaccord entre les tenants de diverses théories devient apparent. Suivant les théories organiques, le bégaiement découle d'un manque de dominance cérébrale (Tranis, 1957), et d'un "epileptic disorder that manifests itself in dyssynergies of the neuro-motor mechanism for oral language". (West, 1958, p. 197). Certains auteurs mettent en doute l'origine organique du bégaiement, (Perkins, 1970). Au contraire, ils proposent des théories psychologiques pour expliquer le bégaiement et relient ce phénomène à des facteurs comme le "role conflict" (Sheehan, 1970), ou le "learned behaviour" (Van Riper, 1970).

Pour Kirk (1972), un langage retardé (delayed speech) caractérise des enfants qui "do not develop speech as expected at their age level, or they develop only a partial understanding of language or vocal expression" (p. 91). Autrement dit, ce désordre se réfère aux enfants dont le langage ne fait pas défaut, mais dont le niveau de développement du langage accuse du retard. Ce retard peut résulter, selon Kirk, d'une perte auditive, d'un retard mental, de désordres émotifs, de privations environnementales, d'une dysfonction cérébrale, d'irrégularités glandulaires ou d'une aphasie congénitale. Bien que ces causes soient aussi responsables de troubles du langage et de la parole qui sont classés dans des catégories distinctes, elles se réfèrent, dans le présent contexte, aux facteurs qui empêchent le développement normal de la parole et du langage, c'est-à-dire leur acquisition.

Reynolds et Birch (1977), eux, ne font pas la distinction entre les troubles de la parole et du langage dus au développement et ceux qui sont qualitativement déficients et dont l'étiologie se chevauche. Pour ces auteurs,

le retard de langage (*delayed or retarded speech*) ne peut servir qu'à qualifier le désordre causé par un développement mental lent, c'est-à-dire retardé. Selon eux, le développement mental lent affecte le degré de développement linguistique ou la quantité de verbalisation significative; il affecte, en outre, la qualité du langage ou la précision de l'expression orale.

Le langage de l'enfant qui a le palais fendu est "characterized by excessive nasality and inaccurate production of many sounds" (Ontario Ministry of Education, 1971; p. 40). Cela résulte d'une difformité structurale "of the roof of the mouth" (Reynolds et Birch, 1977) et/ou de la lèvre supérieure.

La paralysie cérébrale entraîne des désordres qui peuvent varier selon la sévérité et la forme de la paralysie. Ces désordres peuvent affecter presque tous les aspects du langage (Kirk, 1972) et sont liés à un dérangement neuromusculaire. Ce dérangement neuromusculaire caractérise, d'ailleurs, la paralysie cérébrale.

Les troubles de la parole et du langage qui sont associés à une déficience auditive sont effectivement des symptômes qui annoncent des troubles au niveau de l'audition. En l'absence de réseau naturel permettant l'apprentissage de la communication, il va de soi que les troubles du langage et de la parole apparaissent comme des problèmes d'apprentissage verbal, et comme des défauts d'expression orale. Comme Kirk (1972) l'explique :

"Many children who are hard of hearing have not heard certain sounds accurately and so have developed speech with sound substitutions and/or other articulatory defects. In addition, because they sometimes do not hear background noises, they fail to adjust the loudness of their own voices" (p. 251).

L'aphasie, souvent appelée dyphasie, se définit comme suit :

"Disorders of linguistic symbolization; the partial or complete loss of ability to speak (expressive dysphasia) or to comprehend the spoken word (receptive dysphasia), believed to be the result of injury, disease, or maldevelopment of the brain" (Meyers & Hammith, 1976, p. 390).

Parmi les causes d'aphasie, Eisenson et al (1963) nous disent que c'est "a separate syndrome that must be considered among the organic causes of language retardation" (p. 210). Ceux qui désapprouvent cette position soutiennent que l'aphasie résulte d'une interaction entre les facteurs psychologiques et

neurologiques. Ainsi, Bannatyne (1976) propose une explication neuropsychologique de l'aphasie.

Finalement, en plus d'établir une distinction entre les désordres de l'expression orale et de la réception auditive, plusieurs chercheurs ont distingué deux sous-types d'aphasie, et cela, au niveau de causes neuro-psychologiques. Hervett et Forness (1977) s'expliquent de la façon suivante :

"Childhood aphasia usually refers to a language dysfunction associated with some form of central nervous system damage that resulted after language had begun to develop; congenital or developmental aphasia implies that damage to the central nervous system occurred prior to the development of language" (p. 127).

Ainsi, alors que les troubles du langage et de la parole qui se manifestent par des problèmes d'articulation, de voix, de bégaiement et de lenteur à parler semblent causés par des facteurs physiologiques, du développement et environnementaux, les désordres manifestés par le palais fendu, la paralysie cérébrale, la perte auditive et l'aphasie découlent de facteurs essentiellement physiologiques.

C. Fréquence

Dans la documentation, nous rencontrons des variations quand à la fréquence de ces désordres. Cela résulte d'abord du chevauchement des troubles de la parole et du langage sur d'autres catégories de difficultés. Cela résulte aussi du fait que l'on assimile l'aphasie tantôt à un désordre du langage, tantôt à un handicap perceptuel et tantôt à une difficulté d'apprentissage. Néanmoins, la fréquence de ces désordres varie le plus souvent entre 3,5 et 5%. Les estimés de la Manitoba Teachers' Society (1977), ainsi que ceux des dix provinces canadiennes, présentés dans le rapport de la SEEC (The Canadian Committee, 1971) l'établissent à 3,5%. Pour sa part, le U.S. Department of Education soutient que : "some 5 percent of school age children have serious speech problems" (p. 40). Malgré ce léger écart dans les données, il reste que les chercheurs s'entendent pour dire que les problèmes d'articulation occupent la plus grande place dans les troubles de la parole et du langage. Selon Kirk (1972), "approximately 80 percent of speech cases in schools, display functional articulation disorders" (p. 494). Le U.S. Department of Education distribue le 5% des enfants atteints de ces troubles comme suit : "most of them (3%) in articulation, the next highest (0,8%) in stuttering, followed by problems due to

Impaired hearing (0,3%), cleft palate speech, cerebral palsy speech, and voice problems" (p. 40).

D. Identification et évaluation

À moins que les troubles du langage et de la parole soient causés par des facteurs d'ordres physiologiques ou environnementaux, les problèmes reliés à l'acquisition du langage et à l'expression orale sont habituellement perceptibles avant l'entrée de l'enfant dans le système scolaire. Pendant les années préscolaires, il peut arriver que le langage de l'enfant éveille les soupçons des parents, soit parce qu'il "interferes with communication", soit parce qu'il "lacks intelligibility" (Reynolds et Birch, 1977; p. 492), soit parce qu'il ne permette pas "undistracted interchange or verbal language, free from grimaces, phonetic misarticulations, unnatural and unusual voice qualities, speaking rates, and rythms" (Kirk, 1972; p. 74), soit parce que l'usage du vocabulaire et des sons ne convienne pas à un enfant de tel ou tel âge.

Berry (1969) décrit le cycle de développement du comportement verbal comme une séquence de six stades : vocalisation pré-linguistique, balbutiement, imitation, premiers mots, phrases de deux mots, développement de la syntaxe (à 2-3 ans). Les enfants qui ne se comporteraient pas selon ce schème devraient éveiller quelque attention quant à la possibilité de troubles de la parole et du langage, et cela, avant l'âge de trois ans.

Schaub et Ritemour (1977) qui ont présenté un "Developmental Disabilities Preschool Language Program", soulignent que le développement optimal du langage dépend très largement du dépistage précoce de difficultés ainsi que de leur résolution. Cependant, comme cela s'avère pour tout dépistage pré-scolaire, l'identification trop hâtive des troubles de la parole et du langage présente des risques. En 1977, Armour et al ont trouvé, dans un exercice de dépistage utilisant la conversation et la répétition d'une série de phrases, que 10,6% d'un total de 20 813 enfants d'âge pré-scolaire démontraient des problèmes du langage et de la parole. En pareils cas, Kisatsky (1967) souligne que le problème majeur est de déterminer quels enfants pourraient surmonter seuls leurs difficultés dans le cours normal et quels enfants nécessiteraient des soins spécialisés en bas âge.

Kirk (1972) propose qu'un tel programme fasse appel à un clinicien de langage (speech clinician). Ce dernier examine tous les enfants en bas âge afin d'identifier ceux qui nécessitent une évaluation plus approfondie. Il voit aussi à ce qu'un diagnostic précis soit rendu pour ceux qui, lors du premier dépistage, ont éveillé l'attention du spécialiste en la matière. À cette fin, Cooper (1977) a présenté une méthode en sept étapes pour déceler les enfants handicapés en ce domaine : évaluation initiale, interview avec l'enseignant, interview avec les parents, évaluation de la sévérité du désordre, attention suivie des parents, décision de recourir ou non à des soins spécialisés.

Lors de l'évaluation initiale, les tests les plus fréquemment utilisés sont : le Deep Test of Articulation (MacDonald, 1969), le Goldman-Fristoe Test of Articulation (Goldman et Fristoe, 1969) et le Templin-Parley Tests of Articulation (Templin et Parley, 1960). Si les résultats indiquent la présence de troubles de la parole et du langage, il s'agit alors d'entreprendre une évaluation en trois points : évaluation intellectuelle, évaluation du désordre, détermination des causes et des effets secondaires (Kirk, 1972).

L'évaluation intellectuelle se résume habituellement à un test d'intelligence (Wechsler Intelligence Scale for Children). Il s'agit alors de déterminer si le retard de développement du langage résulte d'un défaut de langage ou d'un retard mental. Kirk suggère quatre façons d'évaluer la nature du désordre : "1) obtaining spontaneous vocal responses from the child by showing him pictures to be named; 2) asking the child to repeat after the examiner certain words which will identify the articulation defect; 3) asking the child to repeat sounds in nonsense formation; 4) obtaining samples of his habitual conversation" (p. 78).

En vue de déterminer les causes du désordre et ses effets secondaires, "...the speech clinician will assess critically tongue movements and position, alignment irregularities of the teeth, occlusion of jaws, and palate intactness to note their role, if any, in causing the defect. He will survey the home environment to find whether or not factors there may be responsible for the defect. He will consider other possibilities, including hearing impairment, cleft palate, or cerebral dysfunction" (p. 79).

E. Besoins éducationnels

Pour choisir un programme éducatif qui convienne à l'enfant affecté de troubles de la parole et du langage, Hull et Hull (1973), indiquent que :

"The selection of any child for individual therapy away from the classroom would be made only after all other alternatives had been explored and rejected. The primary goal is to keep the child with a communication problem in the mainstream as much as possible" (p. 300).

Pour réaliser cela, la documentation nous dit qu'il importe surtout de voir à ce que s'établisse une bonne communication entre le spécialiste du langage et l'éducateur de l'enfant. En effet, même si certains désordres graves peuvent exiger des soins particuliers à l'extérieur de la classe, il reste que, dans les premières années d'école, tous les enfants tireraient profit d'un enseignement du langage, qu'ils éprouvent ou non des difficultés particulières plutôt modérées (Kirk, 1972). En pareil cas, le travail du spécialiste de la correction du langage importe et cela, dans les activités régulières de la classe. D'ailleurs, Kirk (1972) suggère que "The speech correctionist supervises this type of program, providing the teacher with material and routine procedures". Le même auteur suggère également que lorsqu'il est question des problèmes d'articulation chez les enfants bilingues, une activité de groupe vaut mieux qu'une attention individuelle. En effet, ces enfants sont portés à partager les difficultés; il va de soi que la présence d'enfants unilingues, dont le langage ne présente aucune difficulté, est nécessaire au développement et à l'acquisition du langage (Kirk, 1972). Il faut également souligner que le retrait des enfants de la classe régulière doit s'accompagner de précautions pour réduire au minimum l'impact de celui-ci. Il faut alors faire en sorte que l'enfant quitte la classe avant la récréation ou avant la fin de la journée. Il faut aussi que l'enseignant soit disposé à faire davantage pour ces enfants en individualisant son instruction, suivant les conseils des spécialistes du langage Reynolds et Birch, (1977). En plus de ces quelques principes concernant le programme scolaire, il faut aussi que l'approche éducative de l'enfant affecté de tels désordres convienne à la nature du désordre.

En ce qui a trait aux erreurs d'articulation, Reynolds et Birch, (1977), suggèrent un enseignement qui comprend trois étapes. Premièrement, l'enseignant doit s'assurer que l'enfant entend l'erreur. Ainsi, l'enfant doit

prendre conscience du/des son(s) avec lequel/lesquels il éprouve de la difficulté; il doit aussi reconnaître leur bonne articulation. Deuxièmement, l'enseignant doit s'assurer que l'enfant peut produire correctement le son en question. C'est alors que l'enfant peut être amené, à travers des approximations successives, à articuler correctement. Troisièmement, le son maintenant bien prononcé doit être intégré au langage courant, et utilisé spontanément.

À cause de l'étroite relation qui existe entre le mécanisme neuromusculaire et la voix, les désordres de cette dernière requièrent un programme éducatif auquel participe un spécialiste du langage. En effet, il arrive souvent que les problèmes vocaux découlent d'une faible coordination musculaire qui, à son tour, détermine les caractéristiques de la paralysie cérébrale. Pour les problèmes de ce genre, Keesee (1976) a présenté un traitement de neuro-développement des déviations de la voix propres aux victimes de paralysie cérébrale. Moncur et Brackett (1974) ont élaboré un manuel détaillé à l'intention des cliniciens du langage dans lequel l'approche éducative des troubles du langage est présentée dans un cadre physiologique et acoustique. Les techniques enseignées comprennent la relaxation, la maîtrise de la respiration, la phonétique et la résonance, ainsi que la mastication.

L'éducation de l'enfant qui bégaye doit surtout viser à supprimer le bégaiement ou à en diminuer les effets. Dans le cas d'un bégaiement aigu, Van Riper (1963), explique que l'enfant a peur de parler et démontre des réactions de recul. Alors, les programmes ne doivent pas seulement viser à corriger le défaut, mais aussi à détourner les effets psychologiques négatifs du bégaiement. Dans le passé, plusieurs théories et approches ont été proposées pour le traitement du bégaiement; West (196) en décrit sept : 1) la psychanalyse; 2) la représentation mentale, c'est-à-dire, l'habilité à visualiser 3) le conditionnement classique; 4) la pratique négative, c'est-à-dire le retrait du bégaiement par l'exercice conscient du bégaiement; 5) la sémantique générale, c'est-à-dire, la "Johnson's Diagnosogenesis Theory" (1956); la dominance hémisphérique, c'est-à-dire, l'utilisation de la main dominante pour écrire et pour parler afin de vaincre le manque de dominance cérébrale; ainsi que 7) les approches somatiques et physiologiques (Kirk, 1972). Parmi les méthodes actuelles, Bloostein et Bruitten (1966) suggèrent que la thérapie vise deux buts

principaux : la réduction des anxiétés à parler et la simplification graduelle des schèmes de bégaiement. Pour sa part, Van Riper (1970) ajoute que :

"Contemporary speech therapy for the stutterer seems to aim at several major goals : 1) to improve the general security and moral of the patient; 2) to reduce the situational and phonic anxiety; 3) to weaken the strength of the stereotype stuttering response; 4) to increase the threshold of discharge; 5) to reduce the reinforcement the stuttering responses acquired by avoidance, repression, and escape-reward (anxiety reduction and frustration release); 6) to give existing fluency some stimulus value. The trend seems to be away from the use of techniques derived at modifying the stuttering when it does occur so that the stutterer may stutter and still be fluent" (p. 53).

Selon Kirk (1972), on semble aujourd'hui insister sur : "1) treatment through behaviour modification techniques, and 2) Sheehan's role-conflict theory and treatment" (p. 90). La théorie du "role-conflict" de Sheehan soutient que le bégaiement découle d'un conflit entre le soi et le rôle. Il s'agit alors de l'adoption d'un faux rôle qui implique un rapprochement et l'évitement.

Les troubles de la parole et du langage qui résultent d'un palais fendu sont traités par la chirurgie ou par l'utilisation de prothèses. Ces deux moyens éliminent l'anomalie structurale qui causait le désordre. Kirk (1972), explique que "Through adequate surgery and skingraftings at the appropriate growth stages, the physical and cosmetic deformities can be obliterated" (p. 95).

Les besoins éducationnels des enfants qui souffrent de désordres dus à la paralysie cérébrale, au retard mental, à la perte auditive, etc. sont présentés dans les sections qui traitent de ces handicaps.

III. LES DIFFICULTÉS D'ORDRE INTELLECTUEL

INTRODUCTION

De façon générale, les difficultés d'ordre intellectuel se réfèrent aux enfants dont le niveau intellectuel s'écarte de la moyenne ou de la normale. Il s'agit donc d'enfants dont le degré d'intelligence se situe au-delà des extrêmes sur une échelle de mesure intellectuelle. La Figure I donne la distribution des pointages du Q.I., selon la forme Stanford-Binet, effectuée par Terman et Merrill (1960). Cette distribution donne les pointages pour sept différents niveaux d'intelligence ainsi que le pourcentage d'enfants appartenant à chacun de ces niveaux.

Terman et Merrill classent comme normaux les 46,5% de la population dont le pointage varie entre 90 et 110. Ainsi, selon la définition de ces auteurs, les enfants ayant des difficultés d'ordre intellectuel obtiendront des pointages supérieurs ou inférieurs aux limites que nous venons d'indiquer.

Kirk (1972) utilise les termes de "mental deviations" pour décrire ces groupes. Il suggère que les cas de déviations mentales soient divisés en deux groupes, c'est-à-dire : "1) Intellectually gifted, and 2) mentally retarded" (p. 9).

Selon Cruickshank et Johnson (1975 :

"The intellectually exceptional child encompasses two large groups, each of which presents significant challenges to educators and each of which has essentially different characteristics. In statistical terms, these two groups contain those children beyond two to three standard deviations from the mean in the typical normal distribution. At one extreme are children who are characterized by high mental ability; at the other extreme are children who may be referred to as "slow learning, and mentally retarded" (p. 4).

Ainsi, la documentation suggère que les enfants ayant des difficultés d'ordre intellectuel tranchent sur la norme intellectuelle. Cet écart de la norme prend deux formes : une intelligence soit supérieure, soit inférieure à la norme.

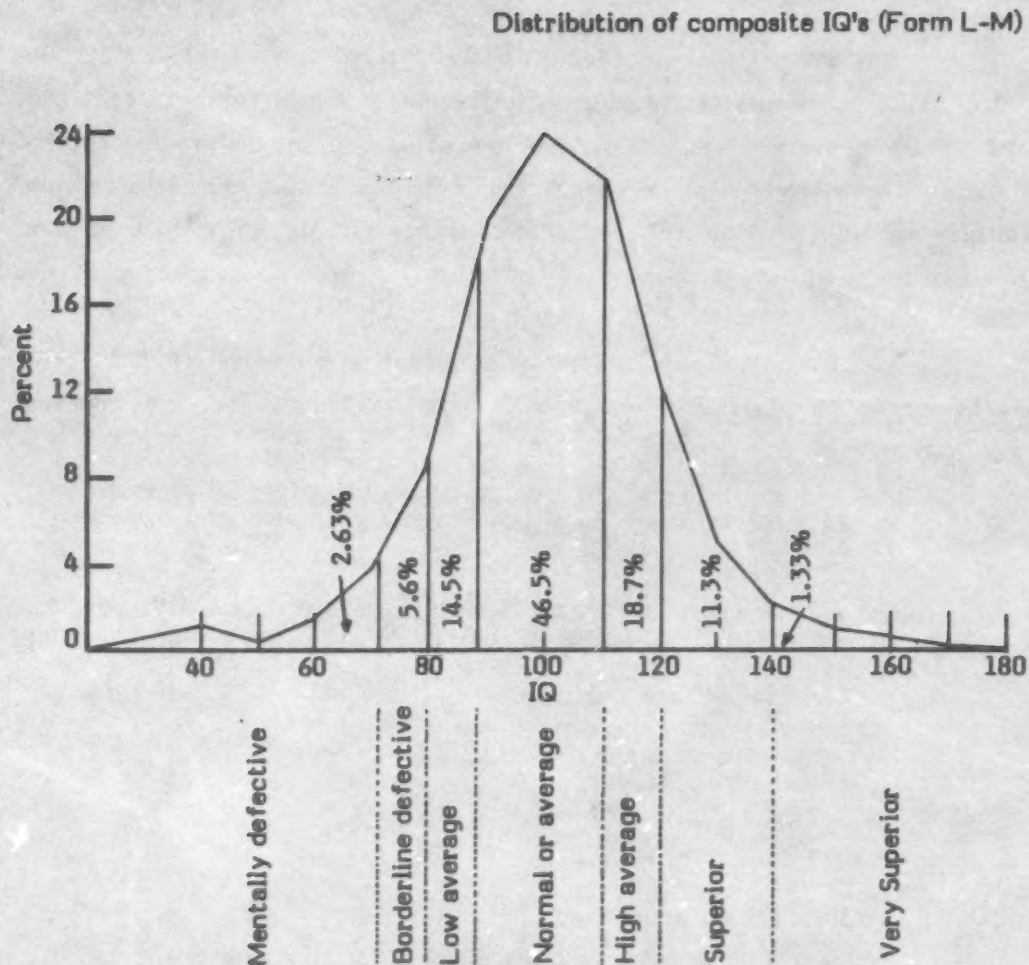
Cependant, ces deux groupes majeurs sont redéfinis et reclassés en sous-catégories. Cela dépend du fait qu'à chaque extrême on retrouve des différences entre les individus. Plusieurs auteurs (Newland, 1976; Sisk, 1975) divisaient en deux groupes les enfants dont l'intelligence dépasse la moyenne : les créateurs (gifted) et les talentueux (talented). Les enfants dont l'intelligence est inférieure à la moyenne sont sujets à de nombreuses classifications. Cela résulte du nombre de niveaux intellectuels établit par les auteurs.

Ainsi, la classification de la supériorité ou de l'infériorité intellectuelle varie considérablement quant au nombre de sous-catégories comprises dans chaque catégorie, ainsi qu'en fonction des critères d'inclusion ou d'exclusion à chacune de ces sous-catégories.

Mais puisque l'éducation des surdoués et des sous-doués doit être un souci constant, tout ce domaine sera maintenant présenté en suivant la classification offerte par le ministère de l'Éducation de l'Ontario (1977) à savoir : 1) les surdoués, 2) les déficients mentaux.

FIGURE 1

Distribution of Composite IQ's



Source : Adapted from Lewis M. Terman and Maud A. Merrill, Stanford-Binet Intelligence Scale, Manual for the Third Revision Form L-M (Boston : Houghton Mifflin Company, 1960), p. 18.

Kirk 1972; p. 9

1. LES SURDOUÉS

A. Définition et classification

B. Fréquence

Les enfants dont les capacités intellectuelles dépassent la moyenne sont définis de plusieurs façons. Ainsi, la fréquence de ces enfants, rapportée dans la documentation, varie considérablement suivant les différents critères employés pour identifier les enfants surdoués. En conséquence, cette section traitera de la fréquence telle qu'elle se rapporte aux définitions et aux classifications.

Gallagher (1975) recommande la définition suivante, originellement développée par The Advisory Panel on the Education of the Gifted and Talented (Marland, 1971) :

"Gifted and talented children are those identified by professionally qualified persons who by virtue of outstanding abilities are capable of high performance.

...Children capable of high performance are those with demonstrated achievement and/or potential ability in any of the following areas :

1. general intellectual ability;
2. specific academic aptitude;
3. creative or productive ability;
4. leadership ability;
5. visual and performing arts;
6. psychomotor ability" (p. 10).

Marland (1971) ajoute que :

"It can be assumed that the utilization of the criteria for identification of the gifted and talented will encompass a minimum of 3 to 5 percent of the school population" (p. 2).

Dewland (1976) établit une distinction entre les enfants créateurs, qui peuvent facilement conceptualiser, et les enfants talentueux, qui font montre d'une grande capacité intellectuelle dans des activités d'ordre plutôt physique et émotif, ainsi que preuve de leadership. Cette approche, qui exige un Q.I. entre 120 et 125, représenterait environ 3% d'enfants surdoués.

Le manuel SEAP (The Council for Exceptional Children, CEC, 1971), établit la distinction suivante :

"The "Mentally Gifted" include individuals whose potential is so high or whose level of mental development is so far advanced that they have been identified by professionally qualified personnel as needing additional educational opportunities beyond those provided by the usual school program... (p. 4).

"The "talented", include individuals identified by qualified personnel as being capable of high performance in one or more areas of special competence. Among those areas of special competence are creativity, leadership ability, special adeptness, and facility in the productive and performing arts" (p. 5).

Selon le ministère de l'Éducation de l'Ontario (1971),

"Gifted refers to students who have outstanding intellectual ability and creative talent and/or demonstrate consistently superior performance in any socially useful endeavour" (p. 23).

De plus, en fixant le critère d'admissibilité à un Q.I. de 130, ces étudiants forment entre un et trois p. 100 de la population scolaire. Ce groupe comprend quatre catégories d'enfants surdoués, soit ceux qui sont :

- "a) of very high intelligence, interested in abstract ideas and principles, enjoy learning from books and adore to marshal thoughts and draw conclusions from what has been learned.
- b) of equally high intelligence but prefer to deal with the concrete solution of problems, enjoy making things manually, inventive and able to construct desired apparatus.
- c) creative, above average intelligence with some special ability, especially in the arts other than painting.
- d) of high intelligence, couple with social maturity, and the ability to get on with others sacrificing own ideas..." (p. 24).

Généralement, les définitions que l'on retrouve dans la littérature appartiennent à l'un des trois types suivants : 1) celles qui disent que la créativité correspond à une grande capacité intellectuelle, et que le talent correspond à un haut niveau de compétence dans un domaine particulier (Kirk, 1972); 2) celles qui définissent la créativité uniquement en termes d'un Q.I. élevé, et le talent en fonction de son application à des domaines comme l'athlétisme, la maturité sociale, etc. (Dowland, 1976; C.E.C. 1977) et enfin celles qui mettent sur un même pied le talent et la créativité.

Les test d'intelligence comme celui de Stanford-Binet, et l'échelle d'intelligence de Weschler (WISC), sont actuellement les instruments les plus utilisés pour identifier les enfants surdoués (Reynolds et Birch, 1977). Kirk

(1972) soutient que ces tests peuvent permettre d'établir la fréquence des surdoués à 0,5% si le critère est un Q.I. de 140, et à 20% si le critère est un Q.I. de 115. Le tableau III présente les échelles de fréquence suivant divers critères.

On insiste actuellement beaucoup sur le besoin de développer d'autres méthodes pour quantifier les surdoués, en soulignant les dangers d'une trop grande dépendance sur des mesures de quotient intellectuel (Kirk, 1972). Il faudrait, entre autres, améliorer les méthodes d'identification des enfants talentueux qui démontrent des habilités supérieures tout en présentant un Q.I. moyen. Getzels et Jackson (1960), ainsi que Torrance (1966), ont montré que plusieurs enfants obtiennent un pointage inférieur à 130 dans des tests d'intelligence tout en se révélant créateurs. Selon ces auteurs, l'utilisation du seul Q.I. comme critère ne stimule pas suffisamment ces enfants pour permettre une évaluation adéquate.

Depuis quelques années, des recherches (Lumebord, 1971, Martinson, 1974), ont été entreprises pour remédier à cette difficulté. En effet, ces chercheurs ont tenté d'établir différents moyens pour identifier un enfant qui possède beaucoup de talent sans pour autant démontrer un niveau d'intelligence très élevé. Nous discuterons dans un autre chapitre de ces méthodes d'identification.

Malgré les difficultés éprouvées pour mesurer l'intelligence, la plupart des chercheurs reconnaissent que les enfants d'intelligence supérieure appartiennent à deux groupes : les créateurs et les talentueux.

De plus, ces mêmes chercheurs acceptent le fait qu'il existe une distinction qualitative entre ces deux groupes de cas exceptionnels. Kirk (1972), croit que les enfants créateurs sont ceux qui démontrent "superior ability to deal with facts, ideas or relationships" (p. 109). Il souligne aussi que :

"We can refer to those with special aptitudes in more specific fields as talented, such as :

The socially talented,
The mechanically talented,
The artistically talented,
The musically talented,
The physically talented,
The linguistically talented,
The academically talented" (p. 109).

TABLEAU III

Approximate Proportions of Schools
Population at Various Intellectual Levels

Stanford-Binet	Per Cent of School Population	
	Average Community	Superior Socio- economic Community
IQ above 140	0,5-1,0	2-3
IQ above 130	2-4	6-12
IQ above 125	5-7	15-20
IQ above 120	10-12	30-40
IQ above 115	16-20	45-60

Gallagher, 1975; p.5

Il importe cependant de noter qu'il y a beaucoup de chevauchement entre les deux. "These are not distinctive differences since talented children usually are gifted intellectually, and most intellectually gifted children have talent in some area" (p. 154).

Enfin, Kirk (1972) et Mafer (1977) attirent l'attention sur le fait que la population des enfants surdoués se divise en sous-groupes comme "The underachieving gifted, the highly gifted, and the handicapped gifted". Nous discuterons de cette classification plus tard, en traitant des besoins éducationnels.

C. Causes

Dans la documentation, nous constatons assez facilement que l'identification des causes d'une intelligence supérieure n'est pas prioritaire. Cependant, il est reconnu que des conditions génétiques, neurologiques et environnementales optimales permettront à l'enfant de développer pleinement tout son potentiel. Bien que l'on croie généralement que l'habileté d'un individu soit fonction de l'interaction entre les influences constitutionnelles et environnementales, il reste qu'une partie du potentiel de développement tient à des facteurs héréditaires. Les études de jumeaux élevés séparément (Jensen, 1970; Linderman, 1969) suggèrent fortement que l'intelligence est, en partie, fonction de données génétiques. En outre Oden (1968), en étudiant des femmes surdouées d'âge moyen, a trouvé que le quotient intellectuel de leur progéniture, quoique légèrement inférieur, se révélait tout de même exceptionnellement élevé, soit, en moyenne, de 133. Terman (1925-1959), en arrive à la même constatation après avoir étudié 1 525 descendants de personnes surdouées; leur Q.I. moyen s'établissait à 132,7.

Au niveau des causes physiologiques, il est établi que le développement physique des enfants surdoués tend à surpasser celui de leurs collègues. Il semble même que ces enfants ont tendance à présenter un meilleur état de santé physique. À leur naissance, ils sont, en moyenne, trois quarts de livre plus lourds que la normale; ils commencent à marcher un mois plus tôt et ils parlent trois mois et demi avant les autres. En outre, on retrouve chez ces enfants moins de défauts sensoriels, de caries dentaires et de malnutrition que dans la

population en général; ils manifestent également moins de problèmes, tant avant que pendant et après la naissance. Kirk (1972), Kendler (1974), Newland (1976), Terman (1925-1959) attirent tous l'attention sur l'importance de facteurs neurophysiologiques dans l'étiologie de la supériorité intellectuelle. Sumption et Luecking (1960) reconnaissent également clairement cette influence. Ils définissent les surdoués comme :

"Those who possess a superior central nervous system characterized by the potential to perform tasks requiring a comparatively high degree of intellectual abstraction or creative imagination or both."

Généralement, l'environnement familial des surdoués procure une stabilité psychologique et un ardent désir de réussite. La documentation insiste d'ailleurs beaucoup sur la grande facilité d'adaptation psycho-sociale des surdoués. On dit même que les réalisations scolaires et professionnelles de ces derniers dépassent de vingt fois la normale. De plus, Oden (1968) montre que la fréquence du crime, des dérèglements psychiatriques, de l'alcoolisme et du divorce est considérablement sous la moyenne chez les adultes surdoués.

Ainsi, bien qu'on ne puisse déterminer avec certitude les causes de la supériorité intellectuelle, la relation de cause à effet ne suivant pas toujours un modèle prévisible, il reste que certains facteurs neurophysiologiques et environnementaux semblent prédisposer au développement d'une intelligence supérieure. Il faut cependant s'empresse de souligner qu'un génie peut, à la rigueur, émerger d'un environnement pauvre, désavantagé et instable, alors qu'un enfant sous-doué peut aussi se retrouver en milieu idéal. Néanmoins, la présence d'un système neurophysiologique parfait, l'absence de contraintes et la présence d'un environnement stimulant et riche favorisent le développement d'individus créateurs et talentueux.

D. Identification et évaluation

Les enfants surdoués démontrent des caractéristiques de comportement qui indiquent aux parents et aux enseignants qu'il faut recourir à un programme accéléré pour rencontrer leurs besoins de développement. Torrance (1974), dans sa "Checklist of Creative Positives", caractérise un surdoué comme suit :

1. Ability to express feelings and emotions;
2. Ability to improvise with common place materials;
3. Articulatness in role playing and story telling;
4. Enjoyment of and ability in the fine arts, drawing, painting, sculpture, etc.;
5. Enjoyment of and ability in creative movement, dance, dramatics, etc.;
6. Enjoyment of and ability in music, rythms, etc.;
7. Expressive speech;
8. Fluency and flexibility in non-verbal media;
9. Enjoyment of and ability in small group activities, problem-solving, etc.;
10. Responsiveness to the concrete;
11. Responsiveness to the kinesthetic;
12. Expressiveness of gestures, "body language", etc.;
13. Humour;
14. Richness in imagery of informal language;
15. Originality of ideas in problem-solving;
16. Problem centeredness;
17. Emotional responsiveness;
18. Quickness of warm-up" (p. 481-482).

Torrance croit que ces caractéristiques peuvent être observées sans recourir aux tests. Il s'agit simplement d'inciter l'enfant à s'intéresser activement aux arts visuels, à la musique, à la danse, aux sciences, etc. D'ailleurs, Roeper (1974) souligne l'importance d'un dépistage précoce pour aider l'enfant à accepter qu'il est différent des autres, et faire en sorte que l'absence de stimulations intellectuelles n'entraîne pas de problèmes émotifs. Il est également opportun de mentionner que les enfants surdoués se caractérisent par la perte précoce de leur innocence, leur perfectionnisme, leur dépendance des adultes, et leurs besoins d'activités physiques ainsi que d'occasions de manifester leur créativité.

Les méthodes permettant d'identifier l'intelligence supérieure chez les jeunes enfants ont été décrites par Kirk (1966) et par Blacher-Dixon (1977). Bien que l'emploi des tests d'intelligence normalisés demeure le moyen le plus utilisé, on doute de plus en plus de leur efficacité à identifier les surdoués. Cela résulte certainement des partis pris culturels inhérents aux tests et à leur incapacité de déceler les surdoués hors des domaines académiques. C'est pour cette raison que des méthodes subjectives d'évaluation, comme la liste de Torrance, sont maintenant très populaires. Ainsi, The Alpha Biographic Inventory, mise au point par Calvin Taylor (Lunvebord, 1977) comporte deux échelles distinctes : la créativité et le rendement académique. Malone (1975) a

développé un instrument pour identifier le comportement des surdoués. Cet instrument sert aux parents dont les enfants fréquentent l'école primaire. Selon l'auteur, cet instrument se révèle particulièrement précis chez les populations multiraciales ainsi que dans les milieux économiquement défavorisés.

Malgré les progrès réalisés dans l'identification des surdoués, aucune méthode n'apparaît encore totalement sûre dans ce domaine. D'ailleurs, Reynolds et Birch (1977) disent : "In searching for pupils who are potentially gifted and talented, it is our recommendation that every reasonable means be employed" (p. 219). Ils proposent alors aux éducateurs de suivre, suivant leur préférence, les six étapes suivantes :

1. Individual intelligence test scores;
2. Earlier achievements, including academic records;
3. Teacher nomination based on observation;
4. Standardized achievement tests scores;
5. Scores on creativity tests;
6. Scores on group intelligence tests."

Lorsqu'on se sert de tests individuels d'intelligence, Martinson (1974) et Thorndike (1975) recommandent l'utilisation du test Stanford-Binet. De son côté, Kirk (1972) souligne que même si les tests individuels d'intelligence demeurent la meilleure méthode, ils sont coûteux en termes de temps et de services professionnels; ils se révèlent donc peu pratiques là où les services psychologiques sont limités. Les dossiers personnels permettent à l'enseignant d'examiner le rendement antérieur de l'enfant. L'éducateur peut ainsi déterminer si l'enfant est académiquement supérieur aux enfants du même âge. Il peut également établir les domaines où l'enfant excelle, et cela de façon répétée. Ces méthodes ne permettent pas le dépistage d'enfants surdoués qui manquent de stimulation et de motivation. Elles se révèlent, en outre, inefficaces si le dossier académique n'est pas remarquable et si la supériorité de l'enfant ne se manifeste que dans les domaines non académiques.

Bien que Reynolds et Birch placent les observations de l'enseignant au troisième rang, il reste que d'autres auteurs, dont Hillard (1976), les recommandent hautement. En effet, l'utilisation par l'enseignant d'instruments d'évaluation du comportement se révèle économiquement viable. De plus, les observations de l'enseignant tirent profit de ses connaissances de la personnalité et du développement de l'enfant. Johnson (1977) a décrit ce qu'on appelle le

modèle SICC5 (Social Interaction and Creativity in Communication), technique d'observation qui permet l'analyse systématique des comportements liés à la créativité. Cependant, même si les observations de l'enseignant présentent beaucoup d'avantages, on ne peut pas s'y fier totalement pour identifier les enfants surdoués. C'est d'ailleurs ce que croient Reynolds et Birch (1977) lorsqu'ils soutiennent que les enseignants ont tendance à surévaluer les enfants motivés et travaillants dont les capacités intellectuelles sont moyennes. Ces mêmes auteurs remarquent que, sur la base d'un bon rendement, les enseignants surestiment "one-fourth to one-third of the most able, according to individual intelligence tests" (p. 223).

Les tests normalisés de rendement comme le Wide Range Achievement Test ou le Peabody Individual Achievement Test servent surtout à obtenir des renseignements sur les capacités académiques de l'enfant. Il faut, cependant, bien comprendre de tels instruments de dépistage avant d'interpréter les résultats. Kirk (1972) souligne que :

"They detect only children who are achieving academically. Emotional disturbances, family problems, peer-group standards of mediocrity, poor study habits, a foreign language background, and many other factors may affect a child's ability to perform academically. In the opposite direction, there are some children who, because of family pressures, good study habits, or intense motivation, achieve at a higher educational level than is consistent with their other abilities or their apparent mental level" (p. 112-113).

Pareilles erreurs de jugements peuvent avoir de sérieuses conséquences sur les progrès scolaires des enfants : d'une part, l'enfant surdoué méconnu est inévitablement enclin à la frustration lorsqu'on le force à se concentrer longtemps sur du matériel qui ne le stimule ni ne l'intéresse; d'autre part, l'enfant jugé surdoué à tort tend à perdre confiance dans sa capacité académique lorsqu'il doit suivre un programme trop recherché pour lui, et à perdre également les caractéristiques, perfectionisme, diligence, etc., qui ont contribué à le faire mal juger.

Les tests de créativité servent de plus en plus au dépistage des surdoués. En effet, des tests précis de créativité sont actuellement disponibles et on reconnaît maintenant que plus la créativité est grande, plus l'enfant peut être considéré comme étant intellectuellement doué. Reste à savoir si la créativité est un facteur d'intelligence ou si les deux éléments, créativité et

intelligence, forment une dichotomie. Selon Kirk (1972), il s'agit d'une question très controversée. Domine (1976) a démontré que la créativité est une fonction de l'intelligence; Martinson et Seagoe (1967) ainsi que Dawn (1970) voient, de même, la créativité et l'intelligence comme deux habiletés interreliées. Par contre, Torrance (1967, 1974) ainsi que Thies et Friedrich (1977) se rangent parmi les chercheurs qui croient l'intelligence et la créativité distinctes.

Cette controverse a amené la polarisation en deux approches de la mesure de la créativité. Ceux qui acceptent la première théorie, selon laquelle intelligence et créativité sont interdépendantes, soutiennent qu'il faut utiliser des tests d'intelligence pour identifier la créativité. Cicirelli (1965) maintient que le Q.I. est le meilleur indice d'un potentiel créateur. Plus récemment, Wallach et Kagan (1976) ont adopté la même position et supportent l'utilisation des mesures de Q.I. comme indices de la créativité.

Ceux qui soutiennent la deuxième théorie, suivant laquelle intelligence et créativité sont distinctes, veulent décourager ceux qui emploient les tests de Q.I. pour identifier la créativité. Ils recommandent plutôt l'usage d'instruments construits spécialement pour mesurer la créativité; ces instruments ont d'ailleurs prouvé leur validité. Le plus grand défenseur de cette position est sans contredit Torrance, (1974, 1976), créateur de l'instrument le plus connu, soit : The Torrance Tests of Creative Thinking. Cet instrument permet d'obtenir des renseignements sur les domaines de la créativité que ne pourraient fournir des mesures traditionnelles d'intelligence (Halpin et al, 1973). Il existe un autre instrument pour mesurer la créativité, qui, lui aussi, a prouvé son efficacité. Il s'agit du Khatena-Torrance Creative Perception Inventory. Cet instrument de mesure biographique peut servir à identifier les adultes, les adolescents et les écoliers surdoués au niveau de la créativité (Khatena, 1977).

Qu'on fasse ou non appel à des tests ou à des sous-tests d'intelligence, ou à des tests plus spécifiquement liés à la créativité, il reste que l'identification des surdoués demeure essentielle à l'élaboration des programmes. Les tests de créativité, en plus d'améliorer la pertinence du dépistage, procurent des informations valables quant à la nature de la supériorité des enfants surdoués.

Les "group intelligence tests", présentent des avantages pratiques. En effet, ils sont faciles à administrer à d'importants groupes d'enfants et ils peuvent amorcer le choix des enfants qui nécessitent un programme spécial. Ils se révèlent moins fiables que les tests individuels et ne permettent pas de différencier les capacités des niveaux supérieurs (Kirk, 1972).

Schlichter (1977) résume bien les tendances dans le dépistage et l'évaluation des enfants surdoués :

"1. The use of multifaced systems, utilizing several measures to derive information on a variety of superior abilities; 2. increased training of teachers and administrators in the recognition of giftedness and talent, and in the use of informal assessment procedures; 3. increased emphasis on early identification."

E. Besoins éducationnels

Il a fallu beaucoup de temps pour que le fait d'être surdoué soit reconnu comme un domaine d'exception susceptible de faire l'objet de programmes spécialisés. En effet, la société se refusait à accepter quelque ségrégation intellectuelle que ce soit chez les enfants, préférant plutôt croire à l'égalité de tous. Martinson (1973), explique que la société craignait que pareille conception élitiste ne vienne en contradiction avec la notion de "chance égale". Bien que cette vision se soit dissipée ces dernières années, elle influence encore certaines personnes engagées à l'égard de l'enfance en difficulté (Reynolds et Birch, 1972). Conséquemment, les programmes offerts aux surdoués sont peu nombreux et moins bien organisés par rapport à ceux dont bénéficient les sous-doués.

Kirk (1972), souligne que :

"Special provisions which are made to adopt the school program to the abilities of gifted children include : 1) accelerating, enriching, or grouping children; 2) designing a curriculum suitable to children with high abilities and 3) utilizing appropriate instructional procedures" (p. 135).

L'accélération peut être une combinaison des éléments suivants, à savoir : une admission précoce à l'école, un saut d'une année d'étude, une fusion de deux années d'études ou une admission hâtive à l'école secondaire ou au collège.

L'enrichissement concerne l'adaptation du programme régulier en vue de procurer des expériences éducatives supérieures à la moyenne. Ginsberg (1976) et Treloar (1976) ont élaboré des méthodes permettant aux surdoués de profiter d'une collaboration entre le système d'éducation et le monde des affaires. Pinelli (1977) a montré comment les ressources de la communauté peuvent servir à encourager la créativité scientifique. Ainsi, une des approches d'enrichissement les plus populaires est celle de Renzulli (1976); celle-ci consiste en des activités d'exploration générale, des activités d'entraînement de groupe et des recherches problématiques individuelles ou en petits groupes.

Le regroupement se réfère aux nombreuses façons d'organiser les classes pour faciliter l'adoption d'un programme accéléré et enrichi. Cela peut se faire en regroupant des enfants dans une classe régulière du niveau primaire, en organisant des sections spéciales de sciences, d'arts visuels, etc. et cela au niveau primaire supérieur ou à l'école secondaire, en offrant des cours avancés au niveau secondaire supérieur ou en présentant des cours spécialisés au niveau collégial. Le regroupement d'enfants surdoués hors des classes régulières peut s'effectuer de trois façons : par la modification de la classe spéciale (retrait à temps partiel), par la classe spéciale, par l'école spéciale. Le modèle d'organisation proposé par Reynolds et Birch (1977) diffère légèrement de celui que propose Kirk. Le Tableau IV résume leur interprétation des possibilités d'organisation éducative, compte tenu du degré de ségrégation des enfants qu'implique chacune d'elles.

Le choix du programme et le placement des enfants surdoués dépendent avant tout des caractéristiques et des besoins des enfants. Il importe toutefois d'examiner les principaux avantages et désavantages de chaque type de programme. Selon la documentation, il importe avant tout que l'enfant placé demeure autant que possible intégré à l'éducation régulière. En plus des avantages financiers évidents, un programme enrichi et accéléré peut répondre aux besoins de l'enfant doué tout en lui permettant de demeurer dans la classe régulière. Ce même programme lui permet, en outre, de côtoyer d'autres enfants dont le développement physique, émotif et social s'apparente au sien (Kirk, 1972).

TABLEAU IV

Ways of Organizing for Instruction

Full Mainstreaming

Complete Segregation



- Special summer programs
- Special schools
- Clustered special classes in regular schools
- Limited enrollment seminars and courses
- Resource rooms and clinical centers
- Limited participation field trips and events on school time
- Cluster groups within the regular class
- Limited participation before and after school groups
- Tutoring carried on in regular class
- Independent and individualized study in the context of the regular class

Reynolds & Birch, 1977; p. 243

Il existe d'autres raisons pour encourager l'intégration maximale du surdoué à une classe régulière. En effet, l'interaction entre l'enfant normal et le surdoué peut encourager ce dernier à faire preuve de leadership. Il faut aussi souligner que la présence d'enfants surdoués dans la classe régulière ne manque pas d'influencer favorablement le rendement des autres enfants (Kirk, 1972). Gallagher (1975) reconnaît que cette intégration à la classe régulière présente peu de problème d'adaptation sociale. "There is little or no question about the general social status of high I.Q. elementary school children. It is high" (p. 39). Cela s'avère particulièrement pendant les premières années du primaire et s'atténue au niveau avancé du primaire. En outre, Gallagher a trouvé que l'acceptation de l'enfant surdoué par le groupe décroît proportionnellement au degré de retrait de l'enfant en vue d'une instruction spéciale. Kirk (1972) souligne d'autres considérations se rapportant au placement (voir Tableau V). Celles-ci peuvent servir à déterminer les besoins en programmes.

Le programme recommandé pour les surdoués se fonde avant tout sur celui de la classe régulière. On demande cependant aux surdoués de suivre ce programme régulier "at a faster rate and their comprehension at any given stage should be deeper and more substantial", Reynolds et Birch, 1977; (p. 239).

Selon Kirk (1972),

"Some of the ways the content can be expanded for the gifted include the following :

1. emphasizing the gross structure and basic principles of the subject matter fields rather than emphasizing individual facts;
2. placing emphasis on how information is derived rather than what is derived;
3. taking the lead from the child's interests and understanding;
4. expanding the curriculum in breadth and depth;
5. providing consultation and guidance" (p. 146).

De cette façon, le programme peut s'étendre et s'accélérer suivant les intérêts des enfants surdoués. À l'intérieur du cadre d'un modèle d'aptitude-traitement-interaction, l'organisation du programme et son contenu représentent une part très importante de l'aspect éducatif. Le dernier facteur inhérent au traitement est relié aux stratégies d'enseignement, lesquelles sont personnalisées pour répondre adéquatement aux aptitudes spécifiques des surdoués.

TABLEAU V

Considerations in Educational Programming of the Gifted Child

1. When a child's patterns of growth in physical, social, mental, and educational areas are all accelerated beyond the chronological age, acceleration in grade placement may be considered.
2. When the physical, social, and the emotional areas are equal to the chronological age, but the educational achievement is advanced, a special class can be considered.
3. When the school system is too small (not providing sufficient gifted children of a particular kind for a special class), enrichment, tutoring, or special sections within the class for the gifted children in the regular classroom is necessary.
4. When the class in which a gifted child is placed contains a preponderance of children of superior intelligence, even though it is not designated as a class for the gifted, enrichment of the program is probably more desirable than special classes or acceleration, neither of which may be necessary.
5. When the child is gifted but underachieving, special attention to his social and emotional problems or possible areas of weakness is called for. Intensive counselling and parent education or even remedial instruction may be more important for this child than his placement.
6. When inner discrepancies in growth are quite marked, as we often find in children with extremely high IQ's, a tutorial or individualized method of instruction may be necessary if the child is found to be unable to adjust to other situations.
7. When school systems feel that enrichment in the regular grades is the most feasible plan, a special teacher or coordinator for gifted children is advisable. Many feel that it is unrealistic to expect every teacher to furnish enrichment in the regular grades. Teachers need the help of a specialist or consultant.
8. Since the research cited earlier indicates that acceleration by early school admission, skipping or telescoping grades, or early admission to college is not detrimental to the social and emotional development of most of the gifted children, consideration should be given to these procedures. Establishing a fixed chronological age as an entrance requirement, as is done in most school systems, is not taking into account the mental maturity of gifted children, whose mental level may be beyond 7, 8 or 9 when they are allowed to enter school.

Kirk, 1972; pp. 144-145.

Bien des auteurs tentent de décrire des méthodes spécifiques d'enseignement, dérivées de certaines caractéristiques d'apprentissage propres aux enfants surdoués. Reynolds et Birch (1977) ont exposé trois de ces caractéristiques ainsi que les méthodes d'enseignement correspondantes :

"Pupils Learning Characteristics,

1. Learning can move at a faster rate than with other pupils.
2. Learning can attain more complex levels than in other pupils.
3. Self-directed learning can begin and can be habituated earlier.

Derived Teaching Principles,

1. Accelerate the pace at which all elements of the curriculum move.
2. Deliberately introduce and teach important abstracts concepts and ideas in the skills and disciplines earlier than usual.
3. Expand opportunities for independent study, discovery and synthesis" (p. 239).

De même, Kirk (1972) a présenté dix caractéristiques de l'apprentissage des surdoués ainsi que des suggestions relatives à l'enseignement. La première caractéristique de Kirk est la même que celle de Reynolds et Birch, mais il ajoute que l'entraînement intensif et la répétition doivent être évités, que les opérations mathématiques peuvent être revues en les introduisant dans les problèmes plus complexes. Deuxièmement, la capacité supérieure de raisonner des surdoués nécessite, chez les enseignants, une préparation plus articulée, qui leur permette d'expliquer plus en détail les problèmes. Les enseignants doivent tabler sur cet aspect de leur pensée, et s'assurer ainsi que les travaux quotidiens vont de pair avec les habiletés intellectuelles de leurs étudiants. En troisième lieu, il faut que le surdoué puisse mettre en pratique, par des discussions, des exercices écrits et des débats, son vocabulaire habituellement riche. Quatrièmement, il importe que l'enseignant ne sous-estime pas la mémoire et la capacité de l'enfant à relier les informations entre elles. Cela pourrait freiner le développement et l'avancement des surdoués. Cinquièmement, leur insatiable curiosité, et sixièmement, leur grand éventail d'intérêts permettent aux enseignants de s'écarter des programmes conventionnels. En septième lieu, il faut encourager les situations qui font appel au niveau élevé d'adaptation sociale des surdoués. Les enseignants doivent éviter de leur porter une trop grande attention afin que les autres élèves ne se sentent pas sujets à comparaison. Huitièmement, on remarque que les surdoués sont critiques et insatisfaits de leur propre rendement. Cela se produit lorsque l'enseignant est indûment exigeant. Bien que les enseignants

s'attendent à un rendement égal à leurs capacités, ils doivent encourager une saine attitude devant les erreurs et les échecs. Neuvièmement, le remarquable sens d'observation des surdoués permet à l'enseignant d'effectuer, plus fréquemment que dans un programme régulier, des relations et des corrélations entre les expériences d'apprentissage. Finalement, le facteur le plus important demeure le fait que plusieurs enfants font montre d'une créativité supérieure à la moyenne. Celle-ci peut être développée selon les nombreuses approches présentées dans la documentation (i.e. Torrance, 1967).

Toutes ces stratégies doivent correspondre aux aptitudes de l'enfant surdoué. Cependant, il ne faudrait pas négliger les sous-groupes particuliers de surdoués dont les aptitudes et les caractéristiques s'écartent quelque peu de la norme des surdoués. Selon Kirk (1972),

"There is a minimum of three types of deviating gifted children who will require special attention over and above the provisions being made for gifted children in general. These are :

1. The underachieving gifted child;
2. The highly gifted;
3. The gifted child with a handicap" (p. 131).

Le premier groupe, "The underachieving gifted child", peut comprendre des enfants dont les antécédents culturels diffèrent et dont les domaines d'habiletés ne sont pas reconnus dans le contexte culturel dominant. Ce groupe peut aussi être composé d'enfants qui, pour diverses raisons, manquent de motivation et n'offrent pas le rendement attendu de leurs capacités (Reynolds et Birch 1977). Pour enseigner aux enfants de ce groupe, Maker (1977) propose un programme qui vise à développer les habiletés des enfants culturellement différents. Il s'agit alors de réduire l'écart entre les niveaux de rendement actuel et possible, d'augmenter l'estime de soi en éliminant les sentiments anxieux, de stimuler la curiosité et d'améliorer la relation parent-enfant. Tous ces éléments sont souvent à la base d'un faible rendement de la part de ces enfants. Fine (1967) souligne que des causes physiologiques, psychologiques et émotives peuvent occasionner un faible rendement chez les surdoués. Il présente alors différents moyens pour prévenir et remédier à cette situation. C'est surtout Renzulli (1973, 1975) qui s'est penché intensément sur la question de l'identification et de l'éducation des surdoués issus de groupes sociaux désavantagés et minoritaires.

Les enfants du deuxième groupe, "The highly gifted", (Q.I. 170 et plus), tranchent sur les surdoués en général du fait qu'ils ont "a more difficult time making personal and social adjustments unless they are given special attention" (Kirk, 1972, p. 133).

Ainsi, en plus de pourvoir ces enfants d'un programme plus enrichi, plus vaste et plus exhaustif que celui des surdoués en général, il faut voir à réduire au minimum l'écart entre leur développement et celui de leurs collègues. "The educational procedures used with this type of child are undoubtedly of supreme importance" (Kirk, 1972, p. 133-134). En ce qui concerne les enfants extrêmement brillants, la documentation soutient que le tutorat est essentiel, à moins de grouper ces enfants dans une même classe; leurs composantes sociales et émotives devront alors être compatibles.

Quant au troisième groupe, "The gifted child with a handicap", il arrive fréquemment qu'il comprenne des enfants affectés de handicaps visuels, émotifs, sociaux, etc.; les capacités intellectuelles de ces enfants sont supérieures et ils démontrent de grandes habiletés dans un domaine ou dans un autre. Au niveau de leur éducation, la règle générale est de combiner des stratégies appropriées à leur handicap ainsi qu'à la nature de leur supériorité. La littérature, dans le domaine de l'éducation des surdoués handicapés, est très abondante. Maker (1977) auteur de "Providing Programs for the Gifted Handicapped", discute amplement de ces enfants dont les difficultés peuvent se situer au niveau de leur apprentissage, de leur développement émotif, de leur comportement et de leur condition physique. Cet auteur insiste surtout sur le fait : "That the single most important thing that the educational system can do is to recognize potential and provide for its development" (p. 37). Il importe également, dans leur éducation, de réaliser un certain équilibre entre l'enseignement destiné à réduire leur handicap et l'enseignement qui sait répondre à leur supériorité. Dans The Gifted Child with Learning Disabilities, Elkind (1975) expose, lui aussi, un programme de modifications et d'adaptations visant à profiter des forces tout en renforçant les faiblesses de ces enfants. Les responsables de ces programmes trouveront dans les travaux de Maker (1976), Nausser (1975), Meeker (1967), Vantour (1976) et Norishima (1974) des éléments fort intéressants pour répondre aux besoins des enfants surdoués handicapés.

Cependant, bien qu'ils ne constituent pas un sous-groupe spécial, les besoins des surdoués handicapés du niveau secondaire diffèrent de ceux du niveau primaire. Pour cette raison l'organisation du programme doit différer (Kirk, 1972). L'approche générale de l'éducation des surdoués handicapés demeure la même au primaire et au secondaire. Au secondaire, toutefois, les enfants ne s'intègrent habituellement pas à une classe définie. Ainsi, l'étudiant se voit offrir plus de flexibilité dans l'organisation et le choix de ses cours. Kirk (1972) propose sept méthodes pour réviser le programme en vue de mieux répondre aux besoins des surdoués du secondaire :

- "1. Increase in counselling and guidance activities.
2. Offering extra curricular activities - school publications, science clubs, hobby clubs, student government, and so forth.
3. Organization of advanced classes in sciences, mathematics, English, and social studies with emphasis on ideas, concepts, and relationships rather than memory.
4. Allowing students to take extra courses to accelerate their graduation.
5. Allowing students to enroll in nearby Colleges and Universities for more advanced courses.
6. Allowing students to obtain advanced credit by examination.
7. Revision of the sequence and content of courses in sciences, mathematics, language arts, social studies, and languages" (p. 143-144).

En conclusion, Schlichter (1977) présente un excellent résumé de la situation des programmes éducatifs pour les surdoués. Il note deux tendances majeures : 1) l'insistance sur le développement du processus de la pensée; 2) la reconnaissance de l'importance des activités qui conduisent à la recherche.

2. LES DÉFICIENTS MENTAUX

A. Définition et classification

B. Fréquence

En général, l'arriération mentale se réfère à la partie de la population dont le niveau intellectuel est inférieur à la moyenne. Selon l'American Association on Mental Deficiency (AAMD; Grossman, 1973),

"Mental retardation refers to significantly sub-average general intellectual functioning existing concurrently with deficits in adaptive behaviour and manifested during the development period" (p. 11).

Selon cette définition, un rendement intellectuel inférieur à la moyenne se réfère à un niveau de déviation se situant sous la moyenne générale de la population, et cela, sur un test d'intelligence normalisé. Les troubles d'adaptation du comportement indiquent des déficiences de maturation, d'apprentissage et d'adaptation sociale. On reconnaît alors dans ce groupe quatre niveaux de sévérité : léger (Q.I. 52-67), modéré (Q.I. 36-51), sévère (Q.I. 20-35) et profond (Q.I. en dessous de 20).

Bien que l'essence des définitions de l'arriération mentale demeure généralement la même et bien que les auteurs s'accordent sur les besoins éducationnels des déficients mentaux, toute unanimité s'arrête là. Comme l'indique clairement le Tableau VI, les opinions varient beaucoup quant à la valeur du Q.I. qui détermine l'arriération mentale, quant à la classification de la sévérité utilisée et enfin, quant à l'étendue de chaque classe de sévérité. Il va donc de soi que la fréquence varie autant que les méthodes et les critères.

La difficulté majeure dans la classification des déficients mentaux tient au fait que certains auteurs assimilent les enfants qui apprennent lentement aux déficients mentaux, alors que d'autres auteurs ne reconnaissent comme déficients mentaux que les enfants qui ne peuvent se débrouiller dans une classe normale.

TABLEAU VI

SEVERITY CLASSIFICATIONS OF MENTAL RETARDATION FOUND IN LITERATURE

SOURCE	Measured intelligence									
	90	80	70	60	50	40	30	20	10	
American Association on Mental Deficiency (in Grossman, 1973)				mild		moderate		severe		profound
American Psychiatric Association (in Chinn et al, 1975)		mild		moderate			severe			
Chinn et al, 1975		dull-normal		educable			trainable			custodial
Dunn, 1973			mild		moderate		severe		profound	
Kirk, 1972	slow learner		educable			trainable			dependent	
Kirk, Kleiban, & Lerner, 1978		borderline		mild		moderate				
Le Ministère de l'Éducation du Québec, 1976			débile mental léger			débile mental moyen				
World Health Organization (in Reynolds & Birch, 1977)				mild		moderate				severe

Le ministère de l'Éducation de l'Ontario (1971) adopte plutôt la deuxième approche :

"The slow learner generally can function reasonably well in a regular classroom although typically he will progress at a slower pace than the average child. Students who are educable or moderately mentally handicapped may be unable to function satisfactorily in a regular classroom without special help, but do have the potential for acceptable adjustment in academic, social and occupational areas when given special educational attention. Pupils who are trainable or severely mentally handicapped have the potential to learn self-care skills in certain routine life activities,...; to adjust to home or neighbourhood (but not to total community); and to develop limited economic usefulness in simple and closely supervised work activity. Totally dependant mentally handicapped children, as the term suggests, are unable to survive without close supervision and assistance in the most routine life activities" (p. 36).

Même si Kirk et al (1978) emploient la classification à trois niveaux, ils reconnaissent également que les groupes limitrophes et d'apprentissage lent sont parmi ceux qui "are found at the lower end of their class in academic achievement" (p. 3). Ces auteurs prétendent que la fréquence de l'arriération mentale, basée sur un Q.I. de moins de 85, est de 16 p. 100.

Pourtant, la description des enfants peu doués présentée par Chimo (1975), (Q.I. de 75, ou d'entre 80 et 90), ressemble beaucoup à celle de Kirk : "capable of competing in school in most areas except in the strictly academic areas where performance is below average" (p. 14). En utilisant comme limite supérieure un Q.I. de 90, la fréquence d'arriération mentale s'établirait alors à 23 p. 100, dans une distribution théorique d'un test Stanford-Binet (Figure 1).

Les interrelations entre la définition, la classification et la fréquence se compliquent d'avantage lorsque l'on se rend compte que plusieurs autres auteurs excluent de leur classification des déficients mentaux, la catégorie de marginaux dont nous avons parlé. Le ministère de l'Éducation du Québec (1976) soutient que la fréquence des déficients mentaux est de 35 p. 100. De ce nombre, 3 p. 100 sont des débiles mentaux légers (Q.I. 55-75), et 0,5 p. 100 des débiles mentaux moyens (Q.I. 25-55). De même, le Rapport Celdic (Roberts et Lazure, 1970) donne une fréquence de 3 p. 100, dont 2,5 p. 100 sont des débiles mentaux légers, 0,4 p. 100, des débiles mentaux moyens, et 0,1 p. 100 des débiles mentaux graves.

En d'autres mots, la variabilité des rapports de fréquence résulte du grand nombre des déficients mentaux appartenant à une catégorie marginale de fonctionnement intellectuel : certains auteurs assimilent ces enfants aux déficients mentaux alors que d'autres s'y refusent. De plus, sans égard à l'approche, le chevauchement des niveaux de Q.I. utilisés pour classer la gravité du malaise, explique l'inconsistance des évaluations de fréquence pour toutes les sous-catégories des déficients mentaux.

Généralement, la revue de la documentation révèle que, par l'inclusion des enfants d'apprentissage lent au groupe des handicapés mentaux, on obtient une fréquence variant entre 16 et 23 p. 100, compte tenu des critères de Q.I. utilisés. Cependant, la plupart des rapports de fréquence comprennent les déficients mentaux légers, modérés et sévères; ainsi leur fréquence varie entre 2,5 et 3,5 p. 100.

La présente revue de la documentation tient compte de quatre niveaux d'arriération mentale : l'apprentissage lent, l'arriération mentale légère, modérée et grave. Celle-ci insiste, néanmoins, sur la discussion des besoins éducationnels des déficients mentaux éducatibles.

C. Causes

Selon Kirk (1972) cinq classes de facteurs peuvent causer l'arriération mentale : des facteurs 1) génétiques, 2) prénataux, 3) périnataux, 4) postnataux et 5) culturels.

Les facteurs génétiques transmis se manifestent par des traits héréditaires. La recherche a actuellement réussi à établir, à cet égard, l'influence de certains désordres biochimiques. Parmi ceux-ci, on note d'abord la phénylcétonurie, une anomalie du métabolisme des acides aminés. Il y a aussi la galactosémie, soit un défaut du métabolisme des glucides. Des anomalies chromosomiques peuvent, enfin, se transmettre génétiquement et causer certains types d'arriération mentale comme le syndrome de Down.

Les facteurs prénataux affectent le développement de l'embryon. Il s'ensuit une anomalie du système nerveux qui entraîne une certaine arriération mentale. Les facteurs qui peuvent causer l'arriération mentale sont nombreux. Parmi ceux-ci, on sait que la santé physique et psychologique de la mère sont des composantes déterminantes. Il reste que les facteurs les plus connus et les mieux compris sont la rubéole et le facteur RH, le fœtus héritant alors d'un facteur RH incompatible avec celui de la mère. La plupart des cas d'arriération mentale (50-65%) résultent de causes prénatales (Kolb, 1970).

Par facteurs périnataux, on entend les conditions qui affectent l'enfant immédiatement avant ou pendant la naissance. On estime à 3% le cas d'arriération mentale découlant de facteurs périnataux (Kolb, 1970). Ces facteurs peuvent causer des blessures au cerveau, l'asphyxie et la prématurité.

Les facteurs postnataux surviennent pendant la jeune enfance. Ils comprennent surtout des maladies qui affectent le développement du système nerveux central (CNS), et perturbent le fonctionnement intellectuel; l'encéphalite, inflammation du CNS, et la méningite, infection virale, sont deux exemples de troubles postnataux qui peuvent causer l'arriération mentale.

Par facteurs culturels, on entend tout facteur de l'environnement culturel qui pourrait causer l'arriération mentale. En règle générale, tout environnement qui prive un enfant de la stimulation requise pour promouvoir le développement intellectuel, augmente les risques d'arriération mentale. De nombreuses études, et en particulier celles de Heber (1970) et de Birchard Dye (1970) ont montré que la fréquence d'arriération mentale était plus élevée dans les milieux socio-économiques défavorisés. Les résultats de l'étude tendent à démontrer que les milieux socio-économiques plus aisés procurent une stimulation intellectuelle supérieure. D'ailleurs, Kirk explique que, bien que la fréquence d'arriération mentale légère et sévère soit constante à tous les niveaux de la société, il demeure qu'on retrouve beaucoup plus d'arriération mentale grave dans les milieux défavorisés. Les résultats suggèrent que des facteurs physiologiques causent surtout l'arriération sévère, alors que l'arriération légère peut résulter de causes physiologiques ou du développement.

On estime que des facteurs postnataux, dont les influences culturelles, causent entre 25 et 30% des cas d'arriération mentale (Kolb, 1970).

Alors que la recherche des causes d'arriération mentale se poursuit, on assiste à la découverte de mesures de prévention. On peut donc s'attendre à une diminution de la fréquence de l'arriération mentale. Bartram (1974) soutient qu'il incombe aux professionnels de la santé et de l'éducation de faire en sorte que la connaissance des causes d'arriération mentale puisse leur permettre de prévenir cette situation. "It is possible to bring about more than a 50 percent decrease in mental retardation..." (p. 12). La prévention comprend, par exemple, l'immunisation contre la rubéole, la consultation génétique et les tests du métabolisme; tous ces éléments peuvent s'intégrer au programme de prévention de l'arriération mentale. Ainsi, la phénylcétonurie et la galactosémie peuvent se diagnostiquer à la naissance; maîtrisées à temps par une diète, elles ne risquent pas de causer l'arriération mentale.

D. Identification et évaluation

Les méthodes d'identification et d'évaluation des déficients mentaux sont, pour plusieurs raisons, les plus importantes composantes des programmes éducationnels de ces enfants. Bien que certains tests neurologiques ou de laboratoire permettent d'identifier plusieurs cas d'arriération mentale avant et à la naissance, ces cas ne représentent qu'une minorité des déficients mentaux. En effet, alors que l'arriération mentale sévère se décèle pendant l'enfance, vu l'apparition de symptômes distinctifs, l'arriération mentale légère ou modérée se révèle, à ce stade, beaucoup plus difficile à identifier. On ne peut, en effet, tirer de diagnostic concluant chez ces enfants avant que leur développement soit suffisamment avancé ou qu'ils aient fait face à leur environnement social et aux exigences académiques.

C'est ainsi que la vaste majorité des enfants souffrant d'arriération mentale arrivent à l'école sans dépistage préalable. Selon Freedman et al (1972), du nombre total d'enfants handicapés, soit environ 3%, seulement 1% sont décelés avant leur venue à l'école. Ainsi, environ 2% de ces enfants doivent attendre que le système scolaire reconnaisse leur besoin d'éducation

spécialisée. Ce pourcentage pourrait se révéler plus élevé car ce 3% exclut un grand nombre de cas douteux et d'enfants d'apprentissage lent.

Le ministère de l'Éducation de l'Ontario (Programs and Services for Children and Youth who are Educationally Retarded) suggère qu'un programme de dépistage de ces enfants soit mis en place le plus tôt possible. Ce programme devrait comprendre des "Group tests, public health and medical referrals, social workers' referrals, Teachers' referrals, etc" (p. 26). De plus, l'évaluation individuelle devra: comprendre :

- "a) Preliminary information concerning factors such as :
Physical (auditory, visual, dental, etc);
Emotional and social adjustment;
Foreign language involvement;
Attendance and school records.
- b) Assessment of factors such as :
Ability to follow directions;
Listening skills;
Reactions to and by fellow pupils;
Hand-eye and motor co-ordination;
Concepts of quantity, space and time.
- c) Individual intelligence, psychological and achievement test results and observations made during testing" (p. 26).

Ce schème insiste nécessairement sur les résultats des tests d'intelligence. Ainsi, il est généralement reconnu que les enfants d'apprentissage lent possèdent un Q.I. qui varie entre 75 et 89; ceux qui sont modérément arriérés ont un Q.I. d'entre 25 et 50; enfin, ceux qui sont sévèrement arriérés ont un Q.I. en dessous de 25 (ministère de l'Éducation de l'Ontario, s. d.).

Cependant, la documentation présente une sérieuse mise en garde lorsque le Q.I. sert à la classification des déficients mentaux. Car, il faut d'abord noter que le Q.I. peut varier selon les types de tests utilisés pour quantifier l'intelligence. Rowe (1977) et Solly (1977) ont tous deux montré, par exemple, que la version révisée du WISC (WISC-R) est un test plus rigide permettant d'identifier plus d'enfants handicapés mentalement que ne le faisait le WISC. Ainsi, il faudra tenir compte du test utilisé avant d'établir les limites des niveaux d'arriération mentale.

De plus, même si les tests visent à mesurer le degré d'intelligence innée, il faut se rappeler que les résultats de ces tests sont inévitablement

Influencés par l'expérience acquise et par la situation sociale de chaque individu (Kolb, 1970). Aussi, Kirk (1972) dit : "In evaluating the placement of children with learning disabilities and/or children coming from different sociocultural environments, consideration must be given to research evidence regarding their placement" (p. 201).

En d'autres mots, cela signifie que pour obtenir des diagnostics différentiels, il faut tenir compte de l'historique de l'enfant et de son environnement familial pour distinguer entre les Q.I. faibles d'enfants issus de milieux défavorisés et ceux d'enfants mentalement handicapés.

D'ailleurs, Freedman et al (1972) soulignent que : "mental retardation has to be considered as a multidimensional phenomenon that involves overlapping physiological, medical, educational, and social aspects of human functioning and behavior" (p. 313). Essentiellement, l'arriération mentale ne devrait pas être perçue exclusivement en termes de déficience intellectuelle. L'évaluation d'un enfant dont l'apprentissage semble déficient doit aussi tenir compte des facteurs psycho-sociaux.

Cette recommandation se fonde sur le fait que, pendant les années scolaires : "social adaptation becomes an important indicator of mental retardation" (Kolb, 1970; p. 302). Les troubles de perception et les problèmes d'adaptation à l'environnement qu'éprouve l'enfant handicapé sont directement responsables des troubles de socialisation et d'adaptation qui l'affectent à l'école.

Ainsi, les mesures psycho-sociales importent au diagnostic permettant de déterminer si les faibles capacités d'apprentissage d'un enfant résultent de déficiences intellectuelles ou d'autres facteurs.

Conscient de cela, le AAMD (Sloan et Birch, 1956) a proposé une classification des déficiences (voir Tableau VII) qui comporte deux dimensions, à savoir : la mesure de l'intelligence et le comportement adaptatif. La mesure de l'intelligence est divisée en cinq niveaux de Q.I. (voir Tableau VI). Le comportement adaptatif comprend quatre niveaux de comportement, suivant deux domaines : 1) savoir fonctionner et se débrouiller seul, 2) pouvoir répondre de façon satisfaisante aux demandes personnelles et sociales.

TABLEAU VII

Developmental Characteristics of the
Mentally Retarded

	Pre-School Age 0-5 Maturation and Development	School Age 6-21 Training and Education	Adult 21 Social and Vocational Adequacy
Level I	Gross retardation; minimal capacity for functioning in sensor- motor areas; needs nursing care.	Some motor development present cannot profit from training in self- help; needs total care.	Some motor and speech development totally incapable of self- maintenance; needs complete care and supervision.
Level II	Poor motor development; speech is minimal; generally unable to profit from training in self-help little or no communication skills.	Can talk or learn to communicate; can be trained in elemental health habits; cannot learn functional academic skills; profits from systematic habit training. (Trainable).	Can contribute partially to self-support under complete supervision; can develop self- protection skills to a minimal useful level in controlled environment.
Level III	Can talk or learn to communicate; poor social awareness; fair motor development; may profit from self-help; can be managed with moderate supervision.	Can learn functional academic skills to approximately 4th grade level by late teens if given special education. (Educable)	Capable of self- maintenance in unskilled or semi-skilled occupations; needs supervision and guidance when under mild social or economic stress.
Level IV	Can develop social and communication skills; minimal retardation in sensori-motor areas; rarely distinguished from normal until later age.	Can learn academic skills to approximately 6th grade level by late teens. Cannot learn general high school subjects. Needs special education, particularly at secondary school age levels. (Educable).	Capable of social and vocational adequacy with proper education and training. Frequently needs supervision and guidance under serious social and economic stress.

Sloan and Birch, 1956; p. 261.

Mercer (1974) a aussi développé un Adaptative Behaviour Inventory qui explore la compétence de l'enfant dans les quatre systèmes sociaux dans lesquels il vit : la famille, le voisinage, l'école et la communauté. Cet inventaire est administré en posant une série de questions à la mère de l'enfant et peut servir pour des enfants âgés d'entre cinq et onze ans. Le Peniston Adaptative Behaviour Developmental Inventory (Peniston, 1975) vise à mesurer le comportement adaptatif des déficients mentaux de tout âge. Les neuf domaines suivants sont ainsi évalués : l'alimentation, la tenue vestimentaire, l'apparence, la perception corporelle, la coordination précise et générale, la socialisation, le rendement académique et le langage. De la même manière, le Vineland Social Maturity Scale (Doll, 1953), et le Denver Developmental Screening Test (Frankenburg et Dodos, 1967) peuvent permettre d'obtenir des jugements cliniques supplémentaires

La compréhension des habiletés personnelles et sociales de l'enfant mentalement handicapé importe non seulement à l'établissement d'un diagnostic différentiel, mais aussi à l'établissement des besoins éducationnels. Une fois recueillies les données concernant l'histoire d'un enfant et connus les résultats de tests psychologiques, il faut déterminer si la sévérité du handicap permet à l'enfant de demeurer dans une classe régulière ou s'il importe de le placer dans une classe spéciale. En d'autres mots, les informations fournies par le diagnostic servent à établir si un enfant est lent intellectuellement, s'il est éduicable ou s'il est profondément handicapé.

La documentation fournit de nombreux exemples caractéristiques de l'arriération mentale; elle contient aussi des définitions qui tiennent compte de certains critères de diagnostics qui serviront de points de repère dans la classification.

Le ministère de l'Éducation de l'Ontario (s. d.) a décrit de la façon suivante le modèle de développement de l'enfant dont l'apprentissage est lent :

- i) **Preschool level :**
Difficult to identify; disadvantaged background may indicate a high risk of academic difficulty.
- ii) **Primary school level :**
Some indications of slowness (especially in the language arts); inadequate development becomes more pronounced with each succeeding year.

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- iii) Intermediate school level :
As content of academic areas requires increased abstract reasoning, generalization, and conceptual skills, learning problems become more critical, and behaviour problems tend to increase.
- iv) Senior school level :
If the program has been inappropriate, discipline problems (Inattention, truancy, apathy, anti-social behaviour, etc...) may mask a sense of inadequacy or of failure.
- v) High school level :
Tend to drop-out as soon as the school permits, unless a practical, vocationally-oriented program is provided. With appropriate training, he may achieve academic success up to the second year of secondary school.
- vi) Adult level :
Most apt to find employment in semi-skilled jobs or trades" (p. 4).

La documentation comprend, cependant, peu de définitions et de descriptions du comportement des enfants qui apprennent lentement. Généralement, on y dit que : 1) ils sont les plus difficiles à identifier, 2) ils se retrouvent habituellement parmi les derniers de classe au plan académique, 3) leur déficience intellectuelle devient plus apparente à mesure qu'ils vieillissent et 4) ils constituent la majorité des enfants affectés de déficience intellectuelle.

La documentation porte, par ailleurs, beaucoup d'attention aux déficients mentaux éducatibles. Cet enfant, que Kirk et al (1973) qualifient d'enfant légèrement arriéré (mildly retarded child), pourrait se développer dans trois domaines :

- "1) minimal educability in academic affairs, 2) sufficient educability in social adjustment to be taught to get along independently in the community, and 3) sufficient occupational educability to become partially or totally self-supporting as an adult" (p. 3).

Les possibilités de développement qui suivent s'appliquent à l'enfant déficient éducatible :

- "1. Ability to function at the second grade level or higher in reading, writing, and arithmetic by the age of 16.
- 2. Ability to read and to understand formal arithmetic, which begins sometime within the ages of 9 and 12.

3. Rate of mental development approximately one-half to two thirds the rate of an average child.
4. School progress one-half to two-thirds the rate of an average child.
5. Limited vocabulary and language. But speech and language may be adequate in most ordinary situations.
6. Sufficient social skills to permit the child to get along with people in the community independently.
7. Ability to perform unskilled or semi-skilled work. Mildly retarded adults can usually learn to support themselves partially or in full" (Kirk et al; 1978, p. 3-4).

Certaines autres caractéristiques peuvent aussi servir au diagnostic :

- "A. Short attention span or lack of concentration and participation, reluctant to try something new.
- B. Low frustration tolerance, easily discouraged.
- C. Play interests correspond more closely to those of children of his own mental age than of similar chronological age..." (Ontario Ministry of Education, 1971, p. 39).

Contrairement au déficient mental éduable, le déficient mental modéré (trainable mentally retarded) ne peut s'éduquer du point de vue académique, ni faire preuve d'une indépendance sociale optimale dans la communauté, ni d'une autosuffisance adulte. Cependant, Kirk et al (1978) soutiennent qu'un tel enfant peut apprendre :

"a) self-help skills; b) social adjustment in the family and in the neighbourhood, and c) economic usefulness in the home, in a residential school, in a sheltered workshop, and sometimes in a job under supervision. Such a child has the following potentialities :

1. Ability to achieve self-care in dressing, ... and other necessary skills, which will make the child independent of parents in the routines of living.
2. Ability to get along in the family and in the immediate neighbourhood.
3. Mental development between one-quarter and one-half that of an average child.
4. Ability to learn to assist in chores around the house or to routine for some remuneration in sheltered workshop, in a residential school, or in a job under supervision.
5. Little ability to acquire academic skills such as reading and arithmetic, beyond the rote learning of some words or simple numbers.
6. Distinctly limited speech and language.

7. Ability to learn eventually to protect self from common dangers."

En outre, d'autres caractéristiques du comportement peuvent servir à identifier le déficient mental modéré :

- "A. Likely to be clumsy, uncoordinated, and slow to react.
- B. May not be physically attractive.
- C. May not have complete control of body functions.
- D. Feelings of insecurity.
- E. May be unable to communicate wants effectively.
- F. Often hyperactive, distractable, excitable, and likely to have developed little skill in self discipline.
- G. May be lethargic and unresponsive" (Ontario Ministry of Education, 1971; p. 39).

L'enfant profondément handicapé, totalement dépendant ou devant être constamment surveillé, est celui qui :

"is unable to be trained in total self-care, socialization, or economic usefulness, and who needs continued help in taking care of his personal needs. Such a child requires almost complete care and supervision throughout his life, since he is unable to survive without help" (Kirk, 1972; p. 166).

La présentation de ces définitions et de ces caractéristiques du comportement a permis d'atteindre un but précis. Il fallait, en effet, démontrer que malgré la variabilité du Q.I. quand il s'agit d'établir la sévérité des déficiences mentales, la documentation a classifié, avec constance, ceux-ci en quatre sous-groupes. Sans tenir compte du facteur purement intellectuel, ces quatre sous-groupes peuvent être identifiés en se fondant sur les besoins et sur les possibilités de développement des déficients mentaux. Ces facteurs indiquent clairement qu'il faut reconnaître l'individualité de ces enfants dans l'élaboration et la planification de programmes spécialisés.

E. Besoins éducationnels

Compte tenu du potentiel de développement différent de chaque sous-groupe, il faut d'abord, pour rencontrer les besoins éducationnels de ces enfants, organiser les programmes.

Pour l'enfant qui apprend lentement, dont le développement atteint entre $\frac{4}{5}$ et $\frac{9}{10}$ de celui de l'enfant normal (ministère de l'Éducation de l'Ontario),

on recommande l'un des trois arrangements éducatifs suivant :

- 1) une attention individuelle de l'enseignant, dans une classe régulière;
- 2) le programme régulier de la classe auquel se greffe un enseignement par un éducateur spécialisé;
- 3) le programme scolaire régulier et la fréquentation à temps partiel, d'une classe spéciale.

Pour l'enfant qui est légèrement déficient (educable mentally retarded), on recommande les arrangements 2 et 3. En plus de cela, on recommande que certains enfants, si besoin est, puissent suivre à temps complet des programmes spécialisés dans les classes spéciales. Kirk (1972) croit qu'au niveau secondaire, ces étudiants devraient être admis dans les classes régulières d'économie domestique, d'éducation industrielle, d'éducation physique, d'arts et de musique. Ils devraient toutefois être placés dans des classes spéciales de lecture, d'arithmétique, d'écriture et d'écriture.

Kirk (1972) dit aussi que les services pour l'enfant modérément déficient comprennent des classes spéciales dans les écoles élémentaires régulières, des écoles de jour dans la communauté, des internats et des ateliers surveillés.

Les enfants profondément déficients (profound mentally retarded) sont habituellement scignés dans des internats, bien que plusieurs d'entre eux demeurent à la maison.

En déterminant les programmes spéciaux nécessaires à l'enfant déficient, on doit décider du placement de l'enfant en s'assurant qu'il puisse fonctionner, autant que possible, comme un enfant normal. On doit ainsi réduire au minimum la ségrégation et éviter l'éloignement de la classe et de l'école régulière, du foyer et de la communauté.

Même si on insiste beaucoup sur l'objectif visé, plusieurs recherches suggèrent que les enfants atteints de lenteur intellectuelle (Q.I. 75-85) font plus de progrès dans les classes régulières que dans les classes spéciales. Par contre, la recherche suggère que l'inverse s'avère chez les enfants légèrement

déficients capés (Goldstein et al, 1965). On a en effet trouvé que les enfants déficients regroupés en classe spéciale ont un concept de soi plus sain, sont moins enclins à l'anxiété que les enfants déficients gardés dans la classe régulière (Guskin et Spicker, 1968). D'ailleurs, Reynolds et Birch (1977) soulignent que "the quintessence of individualization is reached when each child has the maximum opportunity to learn" (p. 294). Pour cette raison, les éducateurs des déficients mentaux, quels qu'ils soient, doivent reconnaître l'impermutableté de l'arriération mentale.

Les possibilités de croissance intellectuelle sont optimales pendant les années préscolaires; voilà pourquoi les spécialistes accordent une attention particulière au dépistage précoce ainsi qu'aux programmes spécialisés. Kirk (1972) souligne que "when intervention is not introduced at the pre-school level, children from inadequate homes tend to retain their rate of development as they grow older. When society offers compensatory education in the form of pre-schooling, a reversal of this development is accomplished" (p. 119-180).

Mais le système éducationnel ne s'intéresse habituellement aux enfants, dont le développement cognitif est lent, qu'au niveau de la maternelle ou de la première année, soit vers 5 ou 6 ans. Depuis quelques années cependant, on favorise énormément l'expansion de l'éducation en bas âge pour les enfants qui présentent certaines anomalies (Ramey et Smith, 1977). Il faut tout de même ajouter que les systèmes qui reconnaissent l'importance de cette expansion sont encore peu nombreux. Au Canada, l'Alberta a fait figure de pionnier en ce domaine en organisant un programme dans lequel parents et éducateurs travaillent ensemble à un "test-teach model" développé par Kysela (1976).

Selon Reynolds et Birch (1977), "The instructional program for cognitively slow pupils should extend from the preschool years, beginning no later than age 3,... and go on through secondary school, with on the job training and placement being part of the sequence leading to graduation" (p. 321).

Ces mêmes auteurs suggèrent que les enfants déficients peuvent non seulement apprendre plus facilement qu'on le croit, mais encore, poursuivre leur apprentissage pendant leur adolescence et leur vingtaine, s'ils ont la chance de le faire et s'ils y sont encouragés.

Le programme éducationnel le plus efficace, quel que soit le degré d'arriération mentale, est celui qui procure une stimulation optimale tout en permettant d'adapter le programme à la capacité individuelle. Voilà qui favorisera chez le déficient mental un sentiment de réalisation.

Nous présenterons maintenant les objectifs éducatifs dans le domaine de l'arriération mentale. Cependant, les recommandations s'appliquent particulièrement aux déficients légers et modérés, même si, à la rigueur, ils peuvent s'appliquer aux cas limites et aux déficients mentaux profonds.

Les trois objectifs majeurs de l'éducation des déficients mentaux éducatibles se présentent ainsi : "1) social competence, 2) personal adequacy and 3) occupational competence". (Kirk, 1972; p. 198). À ces trois objectifs Hewett et Forness (1974) en ajoutent un quatrième, à savoir, "developing basic academic skills" (p. 83).

Bien qu'il soit entendu que le programme éducationnel des déficients mentaux éducatibles doive d'abord développer le potentiel intellectuel, il doit aussi insister sur l'adaptation sociale et le développement d'habiletés; celles-ci permettront à ces enfants de devenir productifs et de se considérer comme des membres satisfaits de la société. Essentiellement, les composantes du programme pour ce genre de difficultés sont les mêmes que celles du programme régulier. Mais il va de soi qu'un programme pour déficients mentaux éducatibles sera "typically slowed down, simplified and stretched out". (Reynolds et Birch, 1977; p. 295). De plus, tout programme fait appel à deux habiletés fondamentales : 1) un jugement critique et 2) un comportement indépendant (Goldstein, 1974; Heiss et Mischio, 1971).

En tenant compte de ces objectifs, certains principes d'apprentissage peuvent maintenant servir de guide dans l'enseignement aux déficients mentaux éducatibles :

1. Never let a child fail.
2. Provide feedback so that the child knows he has responded correctly.
3. Reinforce correct responses.
4. Find the optimum level at which the child should work.
5. Proceed in a systematic, step-by-step fashion.
6. Use minimum change from one step to the next.
7. Provide for positive transfer from one situation to another.

8. Provide sufficient repetition of experiences to develop over-learning.
9. Space the repetitions of material over time.
10. Consistently associate a given stimulus or cue with one and only one response in the early stages of learning.
11. Motivate the child toward greater effort.
12. Limit the number of concepts presented in any one period.
13. Arrange materials with proper cues for attention.
14. Provide success experiences" (Kirk, 1972; p. 214-216).

L'éducation des déficients mentaux modérés vise, quant à elle, à aider l'individu à s'occuper de lui-même, à s'adapter au milieu domestique et au voisinage ainsi qu'à s'autosuffire" (Kirk, 1972). Le développement du langage oral est également un objectif proposé par Hewett et Forness (1974). Pour sa part, Dunn (1973), élargit considérablement les objectifs :

- "1) Self-help basic readiness and independent living skills development.
- 2) Communication, language, and cognitive development.
- 3) Socialization and personality development.
- 4) Vocational - recreational - and leisure skills development" (p. 101).

En général, les programmes éducationnels destinés aux enfants d'apprentissage lent visent à les orienter vers des emplois spécialisés ou semi-spécialisés. Les programmes éducationnels des enfants handicapés éducatifs cherchent à leur assurer une indépendance économique dans des travaux non spécialisés, et à les intégrer à la vie communautaire. Le déficient mental modéré, par contre, devra suivre un programme spécial orienté vers l'apprentissage des soins personnels, et vers la participation à des activités surveillées.

Dans le domaine des objectifs éducationnels, il existe un document récent qui présente un programme, basé sur les besoins à longs termes des déficients mentaux : il s'agit du State of Ohio Curriculum Guide for Moderately Retarded Learners (Mays, 1977). On y trouve des objectifs de comportement liés à chaque niveau de fonctionnement, et qui se rapportent aux niveaux d'âge de 1,5, 3,0, 5,0, 7,0 et 8,0 ans, ainsi qu'à l'âge adulte. Ce document souligne spécialement les domaines suivants : 1) le développement de la facilité à communiquer; 2) le développement de la maîtrise corporelle; 3) la compréhension de soi et des autres; 4) l'acquiescement de responsabilités familiales et sociales; 5) le développement de la capacité de voyager et 6) le développement d'un choix de loisirs.

Il faut également insister sur le fait que, pour satisfaire aux besoins éducationnels des déficients mentaux, les enseignants doivent être suffisamment compétents pour s'occuper des problèmes de comportement et de personnalité de ces individus. Il est reconnu que l'enfant handicapé a connu la frustration causée par des échecs répétés et fait face à des problèmes d'adaptation sociale. Tout cela résulte souvent de difficultés de perception. Cet enfant a également été à l'origine de crises émotives dans sa famille, et les critiques de ses pairs à son endroit ont été abondantes. Pour cette raison Kolb (1970) explique que : "as with children of normal intellectual endowment, frustrations, humiliations, ridicule, anxieties, emotional deprivations, and insecurities" (p. 320-321) sont souvent vécus.

Conséquemment, l'enseignant fait souvent face à un enfant qui est plus perturbé affectivement qu'intellectuellement. En réponse à cela, "Verbal and non-verbal reassurance and praise should be used generously, and situations should be set up that permit the child to succeed. In addition, concrete evidence of affection, in the form of small gifts, toys, and candy is very helpful, as are such pleasurable activities as trips to the drugstore, park and play-ground." (Freedman et al, 1972; p. 327).

La documentation insiste beaucoup sur l'efficacité de la modification du comportement pour promouvoir l'acquisition d'habiletés sociales et prévenir des comportements inacceptables (Mansdorf et al, 1977). Il se peut que l'on doive recourir à des traitements psychothérapeutiques pour traiter l'enfant affecté de sérieux troubles d'adaptation. On suggère aussi à la famille de consulter des spécialistes.

En conclusion, on a suggéré que :

"The new trends in special education include 1) lessened emphasis on academic performance and greater stress on prevocational and vocational training and on practical life experiences; 2) attempts to recognize small rather than large global units of the child's functioning permitting the precise identification of his assets and building an individual program around these assets; 3) operant conditioning techniques based on the principles of reinforcement of desired behaviour by reward; 4) psychiatric guidance and consultation" (Freedman et al, 1972; p. 328).

IV. HANDICAPS PHYSIQUES

INTRODUCTION

Les domaines de l'enfance en difficulté qui seront traités dans la catégorie générale des handicaps physiques sont ceux que le ministère de l'Éducation de l'Ontario a classifiés comme suit : 1) vision limitée, 2) handicaps orthopédiques et autres handicaps physiques.

Les enfants de ces deux catégories ont une caractéristique commune : en dépit d'une infirmité qui les empêche d'apprendre en classe régulière, ces enfants ne diffèrent pas notablement des enfants normaux, en termes d'intelligence et de rendement scolaire. Conséquemment, le contenu pédagogique des programmes des deux groupes diffère très peu de celui des classes régulières. La différence majeure a trait au matériel didactique et aux méthodes d'enseignement.

Ceux-ci, cependant, se distinguent nettement du matériel et des méthodes utilisés pour l'enseignement régulier; des différences importantes existent même à l'intérieur des nombreux sous-groupes de vision limitée et d'autres handicaps physiques, chaque sous-groupe requérant des programmes pédagogiques hautement spécialisés.

1. VISION LIMITÉE

A. Définition et classification

La documentation qui traite des incapacités visuelles se caractérise surtout par ses nombreuses ressemblances avec celle qui traite des problèmes auditifs. Dans ces deux domaines de l'enfance en difficulté, par exemple, l'âge de l'enfant à l'apparition de l'incapacité, le genre d'incapacité, le degré d'altération et le niveau intellectuel important aux fins de définition, de diagnostic et de programmation pédagogique.

Aux fins de la pédagogie, les enfants affectés de handicaps visuels se divisent en trois principaux groupes. Le premier groupe comprend les enfants dont l'incapacité peut être corrigée au moyen de traitement médical ou d'appareils optiques. L'emploi d'appareils correctifs leur permet de recevoir l'enseignement en classe régulière, sans modification aux méthodes d'enseignement.

Le deuxième groupe se compose d'enfants qui ont des incapacités visuelles, qui peuvent utiliser leurs yeux pour apprendre, mais dont le niveau d'habileté visuelle demeure inadéquat aux fins de l'enseignement régulier, en dépit de mesures correctives. Bien qu'ils puissent se servir de vision résiduelle pour apprendre, et bien qu'ils ne soient pas considérés aveugles, ils requièrent des techniques et du matériel didactique spécial afin d'apprendre à une vitesse optimale.

Le troisième groupe comprend les aveugles, qui, comme les sourds, doivent être instruits au moyen des autres sens.

Le Council for Exceptional Children (1977), définit ces deux dernières catégories comme suit :

"Visually impaired individuals are those whose vision is impaired in any of its functions, as manifested by imperfect depth perception, faulty muscular action, or poor peripheral or central vision (POP, p. 5).

"Blind individuals are those who are sightless or who have such limited vision that they must rely on hearing and touch as their chief means of learning" (p. 1).

En termes fonctionnels, la documentation définit très précisément l'incapacité visuelle de ces deux groupes. Tel que Hewett (1977) l'explique :

"Children are considered blind if they meet either of two criteria. In terms of visual acuity, the child is blind if corrected vision in the better eye is 20/200 or less. This ratio refers to distance and states that the child can see at a distance of 200 feet what a person with normal vision can see at 200 feet. The child may also be considered blind if the widest diameter of his or her visual field subtends an angle no greater than 20 degrees, even though visual acuity in that narrow field may be better than 20/200. If the corrected vision in the better eye is 20/70, that is, the child can see at 20 feet what the individual with normal vision can see at 70 feet, he or she is considered partially seeing" (p. 146).

Ainsi, la classification générale des enfants qui ont un handicap visuel se fonde sur 1) la mesure physique de l'acuité visuelle et l'étroitesse du champ de vision ainsi que 2) l'emploi qui est fait du sens de la vue pour apprendre (Kirk, 1974).

Toutefois, divers chercheurs ont récemment conclu que les définitions basées sur des mesures ophtalmiques pourraient se révéler pédagogiquement impropres. D'une part, des progrès en recherche médicale et des améliorations aux appareils correctifs ont permis à beaucoup d'enfants, dont la vision est inférieure à 20/200, d'utiliser leur habileté visuelle résiduelle. D'autre part, on a découvert que l'apprentissage des enfants qui ont le même degré d'incapacité visuelle, selon des tests médicaux, peuvent varier (Kirk, 1972).

Un enfant dont la vision varie entre 20/70 et 20/200, par exemple, peut être incapable de lire des caractères qu'un enfant dont la vision est inférieure à 20/200 peut lire en se servant d'habileté résiduelle.

Pour cette raison, Kirk (1972) suggère ce qui suit :

"New practices, then, have resulted in a revision of terminology. The current terminology for educational purposes is:

1. The visually impaired which refers to those who can learn to read print.
2. The blind, who cannot learn print, but who need instruction in braille" (p. 293).

Bien que les incapacités visuelles puissent être classifiées selon le genre d'anomalie (par exemple : erreurs de réfraction, défaut de la fonction musculaire), l'étiologie (par exemple : maladies, blessure), ou d'autre facteurs, ces classifications ne sont pas pertinentes quant à la prestation de services ou aux stratégies d'enseignement. Nous les excluons donc du présent exposé.

B. Fréquence

Puisque la définition ophtalmologique couramment utilisée décrit la vision partielle comme une vision de 20/70 à 20/200 et la cécité comme une vision inférieure à 20/200, on estime le taux de fréquence de l'incapacité visuelle à 0,1% (Reynolds et Birch, 1977; U.S. Office of Education, 1974). De ce groupe, environ 65 p. 100 possèderaient une vision partielle, et 33 p. 100 sont considérés aveugles (Reynolds et Birch, 1977).

Toutefois, bien qu'elles soient mineures, on note certaines divergences dans la documentation. Le Michigan State Department of Education (1974) établit les taux de fréquence de la cécité partielle et totale à 1,63 et 0,56% respectivement. Le ministère de l'Éducation du Québec (1972), suggère des taux de fréquence de 0,1% et 0,015% pour ces deux même catégories.

Ces chiffres ne tiennent compte que des incapacités visuelles de la population étudiante. Dans la population générale, la fréquence serait beaucoup plus élevée puisque les deux tiers des aveugles ont plus de 65 ans.

Généralement, bien que des défauts de vision affectent environ 20 p. 100 de la population, la majorité de ceux-ci peuvent se corriger par des verres optiques (Reynolds et Birch, 1977). Seulement environ 0,1% de ces handicapés sont affectés au point de ne pouvoir s'adapter à une classe régulière.

À mesure que la recherche continue à identifier les causes et à mettre au point des remèdes contre la perte de vue, on peut s'attendre à ce que la fréquence des deux degrés d'altération visuelle diminuent. En outre, à mesure que la technologie met au point des méthodes d'amplification plus efficaces, on peut s'attendre à ce que le taux de cécité diminue et que le taux de vision partielle augmente proportionnellement.

C. Causes

Les causes des incapacités visuelles ont été identifiées comme suit : maladies infectieuses, accidents et blessures, empoisonnements, tumeurs, maladies générales, et influences prénatales (y compris l'hérédité) (Kirk, 1972).

L'Institut canadien national des aveugles (CNIB, 1974), a énuméré des causes plus précises pour les nouveaux cas de cécité enregistrés en 1974 (N-244), soit les affections suivantes :

"fibroplasie retro-lentale (cause de 6,5% des nouveaux cas de cécité), cataracte (8,9%), glaucome (0,4%), myopie (6,1%), rétinite pigmentaire (4,8%), atrophie du nerf optique (13,7%), uvéite choroïdienne (0,8%), décollement de la rétine (0,8%), dégénérescence maculeuse (5,2%), albinisme (5,2%), nystagmus (9,7%), affections de la cornée et de la sclérotique (2,4%), rétinopathie diabétique (0,4%), et "autre" (35,1%)".

On a, en outre, déterminé que 25,5 p. 100 de ces affections apparaissent avant l'âge de 5 ans; 51,5 p. 100 entre 6 et 15 ans; et 23 p. 100 entre 16 et 19 ans.

La fibroplasie retro-lentale (FRL) a causé la plupart des cas de cécité notés chez les jeunes adultes à des proportions épidémiques qu'elle a prise en 1952-53. À cette époque, elle avait causé plus de la moitié des cas de cécité chez les enfants d'âge préscolaire (Kirk, 1972). On a découvert plus tard que la pratique, alors courante, de placer les enfants prématurés dans des incubateurs à haute concentration d'oxygène, les affectait d'une perte d'habileté visuelle grave, et fréquemment totale. Bien que cette découverte ait amené une diminution remarquable de la FRL, celle-ci n'a pas disparu (Lower-Sieger, 1975).

De la même façon, beaucoup d'enfants qui souffrent présentement de handicaps visuels furent touchés par l'épidémie de rubéole de 1964; celle-ci a frappé, (estime-t-on), environ 30 000 enfants en bas âge aux États-Unis (Kirk, 1972).

À mesure que la recherche médicale réalise de nouveaux progrès, tels ceux qui ont permis d'isoler le virus de la rubéole, de mettre au point un

vaccin contre la rubéole, et de trouver la cause du FRL, on peut s'attendre à ce que la fréquence des incapacités visuelles continue à diminuer.

D. Identification et évaluation

Comme Kirk (1972) le souligne, "The importance of an adequate vision screening program cannot be underestimated" (p. 295). Bien que la cécité totale soit immédiatement évidente, un état de vision partielle peut passer inaperçu jusqu'à ce que l'enfant commence l'école et semble gauche, maladroit, négligent ou retardé, ou jusqu'à ce que l'incapacité soit évaluée spécifiquement.

Les méthodes visant à identifier les incapacités le plus tôt possible portent donc principalement sur les symptômes de la vision partielle. Le ministère des Affaires sociales du Québec (1977) énumère les caractéristiques suivantes, qui signalent la possibilité de vision limitée chez les enfants dès l'âge de 6 mois :

- "1. des yeux, d'une grandeur anormale; sensibilité à la lumière; pleurs excessifs; inflammation; hémorragie; mouvements anormaux des yeux; i.e. nystagmus.
2. difficulté avec la convergence des yeux ou déviation d'un des yeux après l'âge de six mois (Une déviation persistante de la naissance à six mois doit être considérée comme suspecte)" (p. 32).

Ce même rapport affirme aussi que :

"À partir de l'âge de trois ans, il est possible de commencer à mesurer l'acuité visuelle de l'enfant avec, entre autres techniques, les suivantes :

1. le "tableau E" (version modifiée de l'échelle Snellen) ou l'occlusion de chacun des deux yeux ou,
2. le "Project-o-chart, ou
3. le test de convergence et de relief.

Les critères qui déterminent qu'un test de dépistage est positif sont les suivants :

1. les enfants de trois ans qui ont une vision de 20/50 ou moins;
2. les enfants de 4 à 5 ans qui ont une vision de 20/40 ou moins;
3. les enfants qui ont une différence entre les deux yeux de 20 ou plus;
4. les enfants qui font un strabisme" (p. 33).

Plus tard, lorsque l'enfant commence l'école, les caractéristiques qui témoignent d'un besoin d'évaluation ophtalmologique ont été énumérées comme suit :

- "A. Strabismus - crossed eyes;
 - B. Nystagmus - quick, jerky movement of the eyes, usually lateral, but occasionally in a rotary or vertical direction;
 - C. the child's use of his eyes - tilting the head, holding objects close to the eyes, rubbing the eyes, squinting, displaying sensitivity to bright lights, and rolling the eyes;
 - D. inattention to visual objects or visual tasks such as looking at pictures, or reading;
 - E. awkwardness in games requiring eye-hand co-ordination;
 - F. avoidance of tasks that require close eye work;
 - G. affinity to tasks that require distance vision;
 - H. any complaints of inability to see"
- (Ontario Ministry of Education, 1971; p. 36)

Reynolds et Birch (1977) ont aussi établi une liste de contrôle de l'ensemble des caractéristiques d'identification (p. 608) dans laquelle les mouvements et l'apparence des yeux, ainsi que les symptômes qui se manifestent dans le comportement des personnes atteintes d'incapacités visuelles sont exposés. Si une ou plusieurs de ces caractéristiques se manifestent constamment chez un enfant, un examen ophtalmologique est recommandé.

L'ophtalmologue peut alors déterminer si l'enfant souffre effectivement d'incapacité visuelle. Il peut aussi préciser le degré d'altération et le genre de handicap, et, si possible, établir son étiologie. L'information relative à l'étiologie importe puisqu'elle peut révéler d'autres caractéristiques importantes de l'enfant. Certaines causes (par exemple : la rubéole) exposent l'enfant à un sérieux risque d'infirmités multiples. De plus, la cause de l'incapacité prescrit habituellement le genre de traitement médical qui s'impose.

Dans certains cas, un traitement ophtalmologique peut restaurer la vision suffisamment pour permettre à l'enfant de demeurer en classe régulière. D'autres affections se traitent moins bien, ou pas du tout, dans lequel cas, l'ophtalmologue recommande une évaluation pédagogique.

Lorsqu'un enfant atteint 4 ou 5 ans, des instruments d'examen traditionnels tels que les chartes d'acuité visuelle Snellan ou les instruments télébinoculaires peuvent servir à découvrir les troubles de vision et à indiquer si une visite chez l'ophtalmologue s'impose.

Diagnostiquer une incapacité ne représente toutefois qu'une petite étape du processus d'évaluation. Il faut se renseigner davantage avant de pouvoir déterminer le genre de programme dont l'enfant a besoin, et connaître la réaction de l'enfant face à son habileté restreinte, au point de vue social, psychologique, physique et intellectuel.

Cette quête d'information pose un problème puisque de nombreux tests utilisés pour évaluer la personnalité et l'adaptation au milieu social, ainsi que le rendement et l'intelligence, ont été conçus pour et normalisés en fonction des voyants. Kirk (1972) explique que pour évaluer l'intelligence des aveugles, il faut utiliser des tests oraux ou des tests de rendement à modalités tactiles ou kinesthésiques (haptic). Le test Hayes-Binet qu'on utilise pour les personnes affectées d'incapacités visuelles, et les barèmes des tests Wechsler, qui s'appliquent aux habiletés verbales, servent couramment à mesurer l'intelligence des aveugles.

Selon Kirk (1972) :

"The general pattern in the development of tests for the blind is to adapt or invent tests of cognitive functioning that require auditory input and verbal or motor response, or a combination of these stimulus-response channels" (p. 306).

En dépit de ces désavantages, on a démontré que la distribution des résultats des tests d'intelligence d'enfants affectés d'incapacités visuelles suit de très près celle des enfants normaux (Bateman, 1963; Tisdall et al, 1967).

Une évaluation du rendement moteur importe aussi pour déterminer dans quelle mesure le programme spécial devrait accentuer la coordination et les habiletés motrices. Naturellement, les personnes aveugles et celles dont la vision est limitée se révèlent inférieures dans ce domaine à cause de leur mobilité restreinte.

Privé d'une fonction qui permet normalement d'intégrer les expériences sensorielles, l'enfant aveugle, ou dont la vision est limitée, peut éprouver des difficultés de perception dans certains domaines. Bien qu'il puisse toucher la plupart des objets concrets, l'enfant aveugle peut difficilement comprendre, par exemple, des termes concrets tels que montagne, lune, ou couleurs.

Cratty et al (1967) ont étudié la réaction motrice d'enfants aveugles, et en sont venus à deux conclusions. Premièrement, la direction latérale n'est pas aussi bien établie chez les aveugles-nés que chez ceux qui sont devenus aveugles d'une manière accidentelle; les premiers distinguent, en effet, difficilement la droite de la gauche. Deuxièmement, en l'absence d'indices auditifs, les aveugles marchent en s'inclinant de gauche à droite.

Puisque les enfants apprennent normalement en imitant, et que l'enfant aveugle ne peut imiter ce qu'il ne voit pas, il est incapable d'adopter les expressions et les gestes qui accompagnent la conversation. Par exemple, l'enfant aveugle tend à demeurer impassible, et on doit lui apprendre à parler dans la direction de l'auditeur. Ceci est souvent mal compris par les voyants qui se trouvent souvent mal à l'aise en présence d'un jeune enfant aveugle. Cette attitude, jumelée à une tendance à surprotéger l'enfant et à démontrer trop de pitié, confond l'enfant aveugle et peut nuire à son adaptation sociale.

Ainsi, les méthodes d'évaluation devraient aussi tenir compte du milieu familial en identifiant les éléments qui auraient pu nuire au développement. En outre, il faudrait établir la compétence sociale de l'enfant pour identifier les domaines qui requièrent plus d'attention.

Il est étonnant de remarquer que les enfants aveugles tendent, en général, à ne pas éprouver de problèmes de personnalité (Reynolds et Birch, 1977). Les enfants aveugles font preuve des mêmes troubles mentaux et émotifs que les enfants normaux; les déséquilibres qui les affectent ne découlent pas du handicap visuel (Ashcroft, 1963). Selon de nombreux spécialistes (Ashcroft, 1963; Reynolds et Birch, 1977; Kirk, 1972) le principal problème des aveugles est de devoir surmonter les attitudes négatives des voyants.

Par contre, il importe que les éducateurs comprennent que les personnes qui ont une vision partielle "tend to be less well adjusted than either the blind or the seeing" (Lowenfeld, 1973; p. 55). À cause de la nature de leur affection, qui peut présenter une image voilée, déformée ou limitée, ils s'efforcent constamment de s'ajuster à des causes de frustrations que ni les aveugles ni les voyants ne connaissent.

Par conséquent, les incapacités visuelles sont généralement identifiées et évaluées au moyen d'un examen préliminaire, d'une analyse ophtalmologique, et d'une évaluation des caractéristiques intellectuelles, sociales, de rendement etc. de l'enfant.

E. Besoins éducationnels

Chez les handicapés visuels, un programme préscolaire débutant tôt dans l'enfance est essentiel afin de préparer l'enfant à s'intégrer aux classes régulières.

Selon le Plan Quinquennal (ministère des Affaires sociales (1977) : "Par la suite, les parents doivent être guides et conseillers quant à l'éducation pré-scolaire qu'ils doivent assurer à l'enfant afin de maximiser ses chances d'intégration scolaire et sociale" (p. 16).

C'est durant cette période que les parents requièrent l'aide des ressources de la collectivité, par l'entremise de l'école ou d'autres organismes qui connaissent bien l'éducation des handicapés visuels.

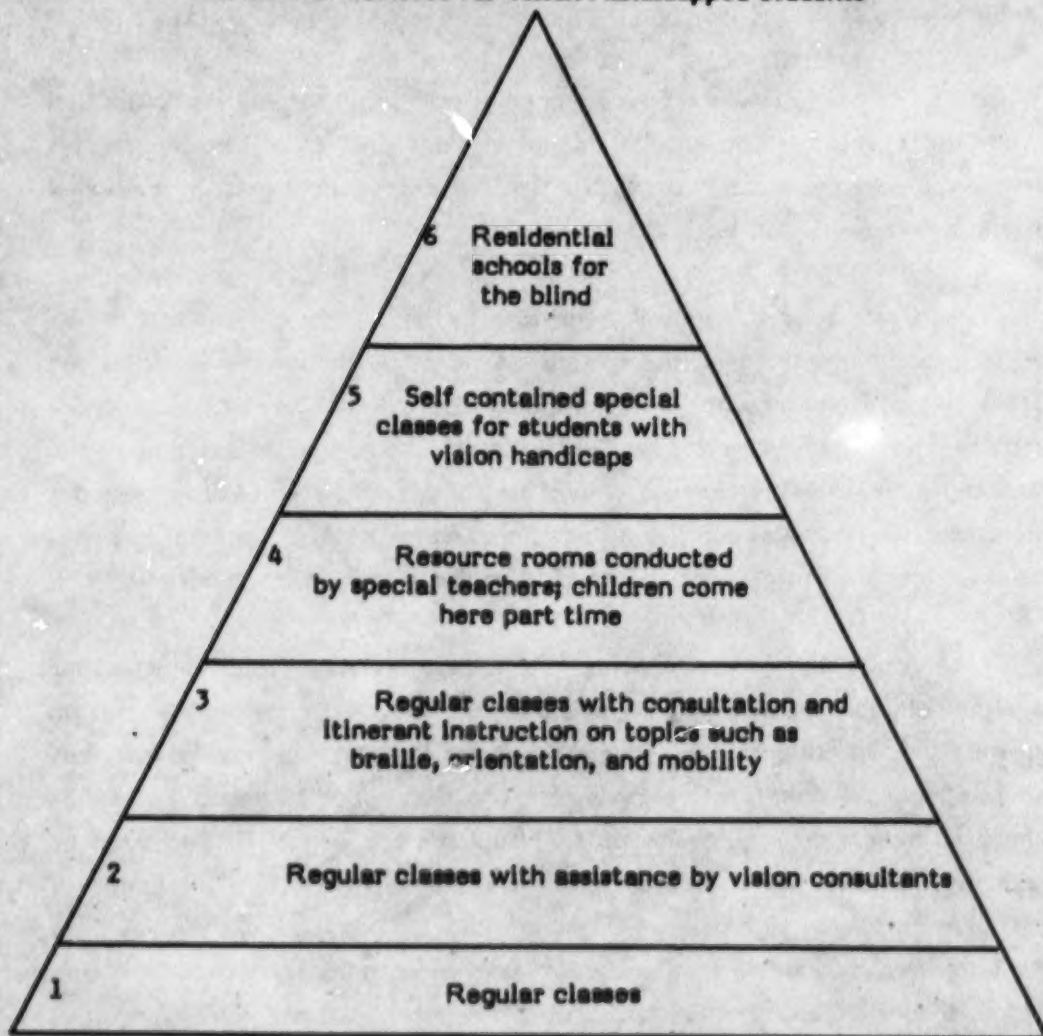
Toute une gamme de programmes visant à satisfaire leurs besoins sont accessibles aux enfants affectés de handicaps visuels, dès qu'ils commencent l'école. Reynolds et Birch (1977) ont exposé six niveaux de services pédagogiques, qu'illustre le Tableau VIII.

Traditionnellement, les enfants qui ont des incapacités visuelles étaient placés dans des classes autonomes ou dans des écoles spéciales. C'est de pratique courante, toutefois, "to give similar services to these children in the regular classes through itinerant teachers or resource rooms" (Kirk, 1972; p. 326).

Le niveau d'intégration qui convient le mieux à l'enfant dépend de nombreux facteurs : le niveau de développement général de l'enfant, du point de vue social, intellectuel, etc... et la présence démontrée des habiletés nécessaires pour s'adapter à une classe régulière; le fait que l'enfant lise le braille ou de gros caractères; l'accessibilité à du matériel spécial (par exemple : un magnétophone; une loupe, etc...) dans l'enseignement régulier; la disponibilité d'un personnel spécialisé qui peut fournir des services dans le cadre

TABLEAU VIII

Cascade of Services for Vision Handicapped Students



Reynolds and Birch, 1977; p. 619

d'une école régulière; les connaissances et les habiletés que possède le professeur régulier quant à l'enseignement des personnes atteintes d'incapacités visuelles.

Dans les classes spéciales, comme dans les internats, la distinction la plus importante qui gouverne le placement des enfants s'établit entre les enfants qui peuvent apprendre à lire des caractères imprimés et ceux qui doivent apprendre le braille.

Cette tendance vers l'intégration se fonde premièrement sur le fait que le programme d'études des enfants atteints d'incapacités visuelles ne diffère pas pédagogiquement du programme des enfants normaux; deuxièmement, le développement social de l'enfant atteint d'incapacité visuelle reçoit présentement plus d'attention qu'il y a déjà et finalement, l'efficacité croissante des programmes préscolaires ainsi que l'amélioration du matériel spécial permettent maintenant à l'enfant de s'adapter à un milieu d'apprentissage normal.

Ainsi, bien qu'on ait encore besoin d'internats, particulièrement pour les basses classes, on tend de plus en plus vers l'élaboration de programmes au sein même de la collectivité, et vers l'organisation d'une gamme de services spécialisés dans le cadre de l'enseignement régulier. Ceci s'applique particulièrement au niveau du secondaire, où les étudiants ont acquis la formation et l'expérience nécessaires pour apprendre dans une salle de classe régulière. Il n'est plus rare, par exemple, de trouver sur les campus des collèges et universités des étudiants aveugles munis d'aides didactiques spéciales. Plusieurs d'entre eux ont obtenu des diplômes d'études supérieures dans divers domaines professionnels.

D'après Kirk (1972),

"The curriculum for the visually handicapped must include:

- 1) adaptation of the general curriculum,
- 2) some additional or specialized content,
- 3) specialized materials and equipment" (p. 333).

L'emploi de la vision résiduelle constitue l'une des plus importantes additions au programme des personnes qui ont une vision partielle. Barraga (1970) rapporte que la perception visuelle peut être améliorée par la formation, et il a conçu des exercices de formation visuelle pour les enfants aveugles qui

ont une vision résiduelle; ces exercices peuvent être utilisés tant dans les classes régulières que dans les classes spéciales. Des aides auditives et tactiles servent aussi à améliorer les habiletés nécessaires pour apprendre.

Les aveugles apprennent habituellement à lire à l'aide du braille, de l'optacon (un instrument qui effectue électroniquement le balayage des caractères imprimés et soulève les traits orthographiques), ou d'autres moyens indépendants de la vue.

Le matériel didactique spécial destiné aux aveugles et aux personnes à vision altérée peut inclure :

- des machines à écrire;
- des dictaphones, des tourne-disques et autres prothèses auditives;
- des livres à gros caractères;
- une machine à écrire le braille;
- une ardoise et un crayon;
- un boulier compteur;
- des projecteurs et des loupes;
- des cartes géographiques en relief;
- un optacon;
- un ordinateur traduisant le braille; et
- une canne à laser.

À l'aide de ce matériel spécial, les aveugles et les personnes qui ont des incapacités visuelles peuvent apprendre leurs matières scolaires au même rythme que leurs pairs. Les modifications majeures au programmes d'études régulier proviennent de la nécessité de fournir des expériences comparables indépendantes de la vue ou employant la capacité visuelle restante. Il faut se rappeler, par exemple, que la présentation de matériel didactique aux voyants est à 85 p. 100 visuelle (Kirk, 1972). Ainsi, les expériences tactiles, les explications verbales, et une attention particulière à l'habileté d'écouter, d'établir des liens logiques, et de se souvenir, caractérisent l'instruction des aveugles et des personnes atteintes d'incapacités visuelles.

Les habiletés supplémentaires que ces individus doivent développer, et que les voyants acquièrent naturellement, incluent une maîtrise de leur

milieu. On doit apprendre aux personnes atteintes d'incapacité visuelle à se déplacer sans problèmes, à trouver des objets et des endroits, ainsi qu'à s'adapter à de nouvelles ou d'étranges situations physiques et sociales.

La première fois qu'un enfant est placé dans une salle de classe régulière, le maître doit d'abord le familiariser avec les objets et les endroits d'importance dans la classe et dans toute l'école.

Ainsi, l'enfant atteint d'incapacité visuelle doit apprendre à s'orienter et à se mouvoir. On insiste donc sur certaines habiletés : comment marcher et se tenir, comment utiliser les sens, comprendre des indices auditifs, éviter les obstacles et les dangers possibles, etc. On vise ici l'indépendance. Pour cette raison, il importe que les parents et éducateurs évitent toute tendance à surprotéger l'enfant. On doit donner à celui-ci la chance de devenir aussi mobile que les voyants afin qu'il puisse prendre l'autobus scolaire, marcher dans les rues achalandées, ou se servir des systèmes de transport en commun.

En conclusion, Reynolds et Birch (1977) ont exposé les caractéristiques d'un programme d'instruction générale destiné aux personnes atteintes d'incapacités visuelles :

1. Early detection,
2. Parent education,
3. Individualized school program,
4. A well oriented regular school staff,
5. High quality leadership by specially trained vision teachers,
6. Materials and equipment,
7. Good models,
8. Good counselling,
9. Screening,
10. Coordination of school and health sciences,
11. School follow-up" (p. 633-634).

2. HANDICAPS ORTHOPÉDIQUES ET AUTRES HANDICAPS PHYSIQUES

A. Définition et classification

Cette catégorie de l'enfance en difficulté comprend des enfants :

"crippled, deformed, or otherwise physically handicapped (exclusive of the visually and auditorily handicapped) and those who have health problems which interfere with normal function in the regular classroom" (Kirk, 1972; p. 349).

Aux fins d'une étude des nombreux systèmes de classification qui sont mentionnés dans la documentation relative à cette catégorie, on a dressé le schéma suivant. On y décrit trois sous-catégories : les incapacités neurologiques, les handicaps orthopédiques et les autres incapacités.

- I. Les incapacités neurologiques :
 1. La paralysie cérébrale.
 2. L'épilepsie.
 3. Les autres (par exemple : dommages au cerveau).
- II. Les handicaps orthopédiques :
 1. Les anomalies congénitales (par exemple : les pieds bots, la spina bifida, la lordose, la déviation de la colonne vertébrale, la torsion du cou, etc.).
 2. Les états adventices :
 - la poliomyélite;
 - la dystrophie musculaire;
 - l'arthrite et
 - les états causés par des accidents (fractures, amputations, etc.).
 3. Les maladies infectieuses :
 - la tuberculose des os et
 - l'ostéomyélite.
- III. Les autres incapacités :
 1. Le rhumatisme articulaire aigu et les défauts cardiaques congénitaux.
 2. Le diabète.
 3. La néphrite.
 4. Les troubles respiratoires.
 5. La fibrose kystique.
 6. L'asthme.
 7. La tuberculose.
 8. L'anémie.
 9. Les allergies.
 10. La sous-alimentation.
 11. Les autres incapacités.

B. Fréquence

Tous les problèmes neurologiques, orthopédiques ou de santé, même bénins ont une importance médicale. Toutefois, du grand nombre d'enfants qui sont atteints de tels problèmes, pertinents au point de vue médical, seulement une minorité requièrent une attention pédagogique spéciale. Comme Reynolds et Birch (1977) le suggèrent, seuls 4 ou 5 des 20 enfants qui ont des problèmes de santé requièrent des programmes pédagogiques spéciaux.

Les taux de fréquence que mentionne la documentation reflètent ainsi le pourcentage d'enfants d'âge scolaire qui ont des besoins pédagogiques spéciaux à cause de problèmes neurologiques, orthopédiques ou de santé. La plupart des données de fréquence (par exemple : Michigan State Department of Education, 1973; U.S. Office of Education, 1974) indiquent que 0,5 p. 100 de la population scolaire a de tels besoins. En comparaison, Friedman et MacQueen (1971) ont examiné les dossiers de 45 000 enfants d'âge scolaire en Iowa; ils ont trouvé qu'environ 0,4 p. 100 d'entre-eux ont des handicaps physiques d'importance pédagogique. Le ministère de l'Éducation du Québec (1977) établit la fréquence de l'infirmité cérébro-motrice à 0.175 p. 100 (Tableau 2.5).

Bien qu'il soit difficile d'estimer les taux de fréquence de chaque sous-catégorie d'handicaps physiques, à cause des variations dans la classification, on a établi la fréquence de la paralysie cérébrale à 0,29 p. 100 (Anderson, 1973).

C. Causes

Vu les nombreux genres d'handicaps physiques, il existe une multitude de facteurs qui peuvent causer des problèmes neurologiques, orthopédiques et de santé. Pour cette raison, et puisque le présent rapport traite, ailleurs, de tous les facteurs étiologiques, les causes précises de chaque handicap physique ne seront pas décrites ici.

En termes généraux, on peut dire que : "crippling conditions and chronic illnesses result from congenital or inherited abnormalities, infections,

metabolic disturbances, traumatic conditions, progressive diseases, or from unknown or miscellaneous causes" (Hewett, 1977; p. 158).

D. Identification et évaluation

La tâche d'identifier les enfants affectés de handicaps physiques relève principalement du monde médical; il en va de même pour nombre des soins requis par ces enfants.

Bien que les éducateurs doivent comprendre le fondement médical de tels problèmes, il leur importe surtout de déterminer dans quelle mesure le problème particulier de l'enfant exige des modifications au programme d'étude régulier, et de trouver le genre de programme spécial qui répondrait le mieux à ses besoins.

L'évaluation de l'enfant affecté d'un handicap physique cherche donc à obtenir de l'information quant au niveau intellectuel, au rendement scolaire, à l'adaptation sociale, aux habiletés motrices et à tout autre facteur qui caractérisent l'enfant, ou qui s'associent avec le genre particulier d'incapacité, et qui ont une importance pédagogique. L'enfant qui est atteint de paralysie cérébrale, par exemple, peut éprouver de la difficulté à écrire; il articule, en outre, difficilement à cause d'un déséquilibre neuromusculaire. Comme l'évaluation vise à identifier les besoins pédagogiques, le genre d'information qui est considérée importante peut varier considérablement; cela résulte de la diversité des problèmes reliés aux handicaps physiques. Un enfant, par exemple, peut brièvement nécessiter une aide supplémentaire spéciale, afin de se rattraper à la suite d'une maladie prolongée. Dans un tel cas, il importe de déterminer les progrès de ses pairs pendant son absence. En ce qui concerne l'enfant paraplégique, il faut aussi tenir compte des restrictions en termes de mobilité, et de l'architecture de l'école, à savoir, si celle-ci donne accès aux fauteuils roulants. Pour ce qui est de l'enfant atteint de paralysie cérébrale, on pourra, en outre, inclure une analyse des habiletés motrices, du développement linguistique et des habiletés orales; celles-ci permettront d'identifier les domaines sur lesquels le programme pédagogique devra s'attarder.

En d'autres mots, l'évaluation de l'enfant affecté d'un handicap physique ne suit pas de règles établies. Plus que dans tout autre domaine de l'enfance en difficulté, les méthodes d'évaluation doivent pouvoir répondre aux besoins individuels des enfants.

E. Besoins éducationnels

Toute une gamme de services peut être requise pour satisfaire les besoins des étudiants affectés de handicaps physiques. Selon Reynolds et Birch (1977), six genres de programmes sont indispensables à la prestation de services adéquats aux étudiants qui ont des incapacités physiques ou de santé :

1. Regular class adjustments - for pupils who can do the work of the regular school if minor adjustments in such things as seating, scheduling and instructional material can be made.
2. Special day classes in regular schools - for pupils who can attend a regular school but who need a specialist to teach them all or most of the day.
3. Special day schools - for pupils who need a school building and equipment totally adjusted to their needs.
4. Homebound instruction - for pupils who must remain at home either in bed or with extremely limited activity for periods of time long enough to interfere seriously with their education unless special teaching is brought to them at home.
5. Hospital instruction - for pupils who must be hospitalized for medical treatment on a 24 hour per day basis for enough time to constitute a major interruption in education and yet who are well enough for instruction."

Inévitablement, la prestation de programmes aux handicapés physiques implique une approche multidisciplinaire. Les parents, les enseignants de classes régulières, les personnes-ressources, les spécialistes du langage, les conseillers pédagogiques, et toutes les autres personnes concernées doivent travailler ensemble afin de répondre aux besoins de l'enfant. Beaucoup de ces enfants, par exemple, ont besoin de sessions avec des ergothérapeutes et des physiothérapeutes ou avec des conseillers en rééducation professionnelle, en plus de suivre leur programme d'études.

Les objectifs généraux de l'éducation des étudiants affectés de handicaps physiques sont les mêmes que ceux de l'éducation des étudiants normaux, auxquels s'ajoutent les considérations suivantes :

- "1. To develop an ability to utilize adapted materials and equipment to effectively master the basic communication skill of writing.
2. To develop an appreciation for and to achieve independent manual dexterity both in the classroom environment and in the non-classroom environment.
3. To develop an appreciation for and to apply expanded capabilities and competencies in performing basic living skills in the area of personal self-sufficiency" (Gearheart, 1974; p. 32).

Kirk (1972) suggère que durant les années préscolaires, l'éducation de l'enfant affecté d'un handicap physique insiste sur le développement des habiletés motrices, du langage et de l'articulation, des facteurs psychologiques, de la perception visuelle et auditive, de la discrimination, de la mémoire ainsi que de la capacité sociale et émotive.

Le programme de l'école primaire constitue une extension du programme préscolaire en ce qui concerne la fourniture d'aide spéciale, de physiothérapie, d'ergothérapie, de thérapie récréative et de la correction de l'articulation spécialement chez l'enfant atteint de paralysie cérébrale. À ce stade, on porte beaucoup d'attention à l'écriture, domaine qui présente beaucoup de difficultés à l'enfant affecté d'un handicap physique. On enseigne couramment aujourd'hui le système de symboles Bliss aux handicapés qui éprouvent beaucoup de difficultés à communiquer.

S'ils obtiennent une attention pédagogique appropriée dans les classes primaires, les enfants affectés de handicaps physiques auront acquis une certaine indépendance et se seront adaptés à leur handicap lorsqu'ils commenceront l'école secondaire.

Les programmes ressemblent beaucoup à ceux des classes régulières. La conception architecturale de l'école doit toutefois tenir compte des besoins de passerelles d'accès pour les fauteuils roulants, de salles de toilettes spéciales, etc. Certaines écoles secondaires avant-gardistes s'unissent et organisent des sports d'équipe à l'intention des handicapés.

V. LES POLYHANDICAPÉS

Est considéré comme polyhandicapé "the presence of more than one handicap in an individual" (Hewett, 1977; p. 182). Le terme polyhandicapé s'applique à une combinaison de conditions exceptionnelles telles qu'énoncées dans cet ouvrage.

Le SEAP Manual (CEC, 1977) indique précisément les besoins éducationnels de ces handicapés : "those who have a combination of two or more handicaps which produce learning, developmental, and/or behavioural problems" (POP, p. 4).

La documentation mentionne rarement la fréquence des polyhandicapés puisqu'il est difficile de définir le nombre d'enfants qui ont plus d'un handicap mais qui suivent un programme créé en fonction d'une seule difficulté. Plusieurs enfants affectés de handicaps multiples figurent déjà dans les données statistiques d'une catégorie particulière d'incapacité.

Comme Hewett (1977) l'explique, "one-half of all exceptional learners have two or more educationally significant disabilities" (p. 184).

Pour fins de définition, et aussi en vue de déterminer le nombre de ces de polyhandicapés "the term should refer to children with two or more disabilities that are so severe that children so affected cannot profit from an educational program established for any one disability" (Hewett, 1977; p. 182).

Selon le U.S. Office of Education (1974) 0,05% des enfants seraient admissibles à ce genre de programmes. On estime à 0,0128% le nombre des polyhandicapés dans l'état du Michigan.

À cause de la diversité des polyhandicapés, le présent rapport n'entend pas traiter de la définition et de la classification, de la fréquence, des causes, de l'identification et de l'évaluation des besoins éducationnels se rapportant à chaque cas. D'ailleurs, tout dans cette étude peut être considéré dans le contexte des polyhandicapés, en ce que l'éducation doit se fonder sur des principes propres aux incapacités.

En terminant, voici ce que Reynolds et Birch (1977) proposent :

"Most children with severe multi-handicaps, those who are both blind and deaf, or both blind and very slow in cognitive development, for example, are usually served in special school settings. Special units are sometimes established within residential schools, or in community settings, where a spectrum of specialists can combine their resources to serve those complex children" (p. 607).

CONCLUSION

L'éducation de l'enfant en difficulté doit d'abord et avant tout tenir compte des besoins de chaque enfant. Cela importe, d'ailleurs, plus que toutes les classifications qui peuvent s'appliquer au domaine en question. Il reste cependant que les classifications importent dans la mesure où elles nous indiquent la ou les sortes de difficultés qu'éprouve chaque enfant.

Ainsi, la revue de la documentation que nous venons de présenter se veut un instrument de travail utile à tous ceux qui élaborent des programmes d'éducation pour l'enfance en difficulté.

Il faut également souligner que cette revue, en plus d'exposer les besoins individuels de chaque enfant en difficulté, présente des conclusions qui s'appliquent à toutes les catégories d'enfants en difficulté.

La première conclusion qui se dégage souligne l'importance du dépistage précoce. On peut ainsi donner raison à Kendall lorsqu'il dit que "only a small number of exceptional children, less than one per cent, are identified before entering school. These include only the severe to profoundly handicapped, the multihandicapped, the blind, the severely retarded, and the psychotic" (1972; p. 74).

La deuxième conclusion vise l'intégration. Plusieurs spécialistes croient que les programmes préparés à l'intention des enfants en difficulté doivent permettre une intégration maximale à la classe régulière. Pour s'adapter à cette nouvelle approche, il va sans dire que les systèmes éducatifs devront modifier leurs politiques et leur organisation.

CONCLUSION

L'intégration maximale à la classe régulière peut exiger la transformation des lieux physiques, la fourniture d'appareils spéciaux, le transport des étudiants et un personnel professionnel affecté à chaque école.

Une troisième conclusion devient, dans cette revue, très pertinente. Il s'agit de la formation des maîtres. Ainsi, toute formation régulière d'enseignants ne peut ignorer les composantes majeures du domaine de l'enfance en difficulté. Tout enseignant devrait savoir reconnaître les symptômes d'une déficience quelconque, pouvoir en faire une évaluation sommaire et réduire au minimum les effets de ces difficultés sur les enfants.

Cette revue nous a aussi montré que répondre aux besoins de l'enfance en difficulté exige des services nombreux et diversifiés.

Enfin, il convient d'insister sur le fait que les services à l'enfance en difficulté, dans le cadre de responsabilités multi-disciplinaires d'évaluation, de planification et d'enseignement, utilisent toutes les ressources qui peuvent contribuer à améliorer la qualité de vie des enfants en difficulté.

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